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ABSTRACT

This report describes the activities and recommendations of a study team that attempted to reform the Korean educational system to increase its efficiency and make it more responsive to the nation's needs. Using a systems approach, the study team collected historical, cultural, and educational data, including demographic reports, economic forecasts, manpower needs projections, educational fiscal data, current and long-range educational plans, and information on educational objectives and attainment. These data were analyzed in terms of future manpower needs and educational output, estimated cost benefits, and strategies for appropriate introduction of innovation and technology into the educational system. Alternative approaches for relating resources to educational objectives were examined. Based on this analysis, the study team recommended a number of major changes intended to provide a better, more relevant education for Korean young people, at a lower unit cost than the present Korean educational system. (Author/JG)

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FINAL REPORT

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SYSTEMS ANALYSIS FOR EDUCATIONAL CHANGE:
THE REPUBLIC OF KOREA

edited by

Robert M. Morgan

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BEST COPY AVAILABLE

Department of Educational Research
The Florida State University
Tallahassee, Florida

April 1971

EA 008 014

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The Florida State University Study Team is indebted to so many people for help with this project that it would be impossible to name them all. The list includes hundreds of Korean teachers, school administrators and students from all over the nation. The team visited schools at all levels in all of the provinces of Korea as well as provincial school district offices and universities. These fellow professionals opened their schools and their store of knowledge and experience to us. They shared our concerns, answered our questions, reacted to our ideas and sympathetically tolerated us and our interference as we were learning about their educational system. To these warm and generous educators of the Republic of Korea, the study team is most indebted, and it is to them that we extend the largest measure of our gratitude.

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CHAPTER ONE

INTRODUCTION AND SUMMARY

The major aim of this study was an attempt by the Republic of Korea to find if it might be able to organize its educational resources in ways that would make its educational programs more responsive to the nation's needs and, simultaneously, function more efficiently than its present educational system. This general problem can only be addressed by answering a large number of corollary questions and the Korean government with the cooperation of the U.S. Agency for International Development invited the Florida State University to mount a project for that purpose. In the planning phase of the project it was judged that a "systems approach" to the analysis of Korea's educational sector would be most suitable and a range of expertise and competence was identified as critical to the survey and analysis process. It was quickly apparent that the varieties of needed competencies would require an interdisciplinary team of specialists and the University assembled a study team of seven persons. The study team included (1) an economist; (2) a manpower specialist; (3) an educational administrator-manager; (4) an educational technologist; (5) a teacher training specialist; (6) a systems management specialist; and (7) a behavioral scientist. The project also utilized several American and Korean consultants as they were needed. The economist, a graduate of Seoul National University, was also a native Korean.

The study team spent three months in the Republic of Korea gathering information and data about the educational system, the economy, the nation's needs and wants for its educational programs and the resources available for potential improvement of the system. Prior to its arrival in Korea, the study team had identified several areas in which information was needed and the Central Educational Research Institute (CERI) assembled an extensive inventory of historical data, research reports, planning documents and other relevant material. This preliminary work by CERI proved to be a great timesaver and added significantly to the efficiency of the study team. The early portion of the team's stay in Korea was devoted to identifying additional information requirements and more carefully formulating the questions that needed answers. CERI and the Ministry of Education then worked with the team in identifying the most appropriate sources of information and answers to the questions. At times during the period in Korea the study team operated as a whole, but more often the individual members of the team worked separately with counterpart Korean specialists. Before the three months were over members of the study team had visited schools at all levels throughout Korea and had talked to hundreds of teachers, school administrators and students. The team also worked closely with several Korean government agencies, most particularly the Ministry of Education (MOE) and the Economic Planning Board (EPB). By the end of the team's stay in Korea a great deal of information had been gathered, which the team then began to sift, organize and analyze.

Clearly, the study team could not in the few months available become in-depth experts in the social, economic and educational affairs of the Republic of Korea. However, a great deal was learned. From what was learned the study team formed certain impressions, developed conclusions and made some rather sweeping recommendations for educational reform in Korea. The team recognizes that there is a danger of incompleteness and even inaccuracy in so hurried an information collection, but has judged the available data of sufficient validity to justify its conclusions and recommendations. Doubtless, there will be some errors or data gaps in the study that will be apparent to the experienced Korean educator, and it will be important for Korean government officials, educators and researchers to determine the effects on conclusions and recommendations of any such errors.

In the survey and analysis, focus was on those issues which would help the Korean Republic provide a better, more relevant education for more Korean young people at a lower unit cost and at a total cost not greater than the nation could afford. To this end, the study team collected historical, cultural and educational data, including demographic reports, economic forecasts, manpower needs projections, educational fiscal data, current and long-range educational plans and such information as was available on educational objectives and attainment. The data was analyzed in terms of future manpower needs and educational output, estimated cost benefits, and strategies for appropriate introduction of innovation and technology into the educational system. Alternative approaches to relating resources to educational objectives and problems were examined.

Economic Factors

In the post-Korean Conflict period, the Korean economy has experienced remarkable industrial progress and growth. There seems to be general agreement among economists, both Korean and foreign, that the economy will continue to grow in the foreseeable future, will become somewhat more stable and will lead to an improved balance of payments position. The labor force is increasing steadily and the rate of unemployment is decreasing. All indications are that in general business will be good but in an economy as dynamic as that of Korea, economists do not appear to be able to predict very many years in the future nor with much specificity what that business will consist of. It seems unlikely that manpower needs forecasts that extend more than two or three years into the future will be of much validity -- particularly at the technical and subprofessional levels. Yet, it is at these levels that Korea is likely to develop its greatest manpower needs in the next several years. It is hypothesized that the manpower deficiencies will be qualitative rather than quantitative. At the present time in Korea it is not unusual for a job holder to have an education which is largely unrelated to the particular job functions performed. Furthermore, manpower waste through overqualification of incumbent job holders can be observed and may be anticipated to increase. A major problem is likely to result in the future from the lack of congruence between the nation's manpower requirements and the projected supply of skilled labor, subprofessionals and technicians. It is suggested that the only long range solution to these problems is a reordering of the educational priorities in the schools of Korea.

In recent years, the burden of financing public education in Korea has increasingly moved to the federal government and away from the private citizen, though the private citizen is still a heavy contributor. The formal educational system of Korea has become, to a large extent, a publicly controlled service. It is noted that purely in terms of economic needs, the quantity of schools may be sufficient for the next two or three years, but the quality of human resources produced by existing middle and high schools can reach neither the level for which purpose these institutions are intended nor that required for the nation's employment needs. The study team contends that investment in education is as important to economic development as investments in physical capital. As investment in education competes with investment in physical capital in the allocation of scarce national resources, it will be prudent for Korea to invest relatively more in the middle schools than in the higher levels of the educational system. Two rate of return studies were undertaken in this project, which indicate that for the high school level, the rate of return (11.2%) is not much different than that for the college and university graduates (9.5%). The rate of return for the middle school education, however, is noticeably higher (20.0%). This latter rate of return is, in fact, higher than that for the average capital investment in Korea at the present time.

There are important implications of these economic and manpower considerations for governmental and educational decision-makers in Korea. The greatest needs for manpower in the years ahead will be at the level of the middle school graduate. The rate of return on investment is astonishingly high at this level. The educational programs through the elementary and middle school are not as appropriate to the future economic needs of Korea as they could be.

Using simplistic economic criterion such as earnings, employment and maximizing economic benefits, one would conclude that the expansion and improvement of the elementary and middle school programs should be given high priority. There are also social and humane arguments to support this contention.

The Contemporary Korean School System

The educational goals that characterize the Korean elementary and middle schools appear to be restricted to the conventional academic domain. The student learning outcomes at these levels fall almost exclusively into the informational and skill categories of educational objectives. Students are acquiring the skills of reading, writing and computation, though with variable proficiency. The system seems to be characterized by rote memorization of classically academic subjects with the overriding objective being to prepare the student for the national competitive examinations. These exams are used to select those students who will be permitted to enter the next level of education. The exam for entrance to the middle school has been eliminated recently, but the study team did not see evidence that this action is having any positive effects on the curriculum. The existing curriculum is not as relevant to preparing Korean children to live and prosper as adults as it could and should be. The study team has not attempted to specify educational objectives. This can only be done by Korean educators. However, the team feels the curriculum can be broadened to include the teaching of inquiry skills, problem solving approaches and generally attend more to process objectives -- and that these should not only be learning outcomes, they can also serve as effective instructional means. A general addition to the elementary-middle school curriculum and important to the enhancement of its relevance, would be the addition of preoccupational education. It is suggested that a properly conceived preoccupational program would add to the graduate's employability, his retrainability and his occupational mobility. In other words, the products of nine years of education in Korea can grow into a valuable inventory of manpower which with limited but specific additional training could be prepared for technical and skilled occupations as these needs develop and change.

The study team predicts that the present Korean educational system cannot in its present form achieve these important objectives through simple expansion or minor alteration of the existing system. An additional problem is that with 6.7 million children in school in the age range of six to fourteen years nearly a million youngsters are out of school. By 1975 there will be 8.2 million Korean children in the eligible age range for the elementary and middle schools. There are many reasons -- manpower needs, societal stability and humanitarian -- that led the study team to conclude that it is essential to expand free, universal education to include the middle school level. It was noted that free education as it is understood in the United States does not exist in Korea except for a few, very poor families. Almost all families contribute directly, through purchase of textbooks, tuition and various fees, to the cost of educating their children. When these hidden contributions to school operations are added to the visible tax contribution, the per student per year cost is estimated to average 12,878 Won for the elementary and middle schools combined.

A Proposed New Educational Model

In order to develop a nation of people, all of whom have been prepared for a life of fulfillment in terms of general occupational and citizenship education, the study team submits that a nine-year, free and compulsory educational program is necessary. If the public schools through the ninth year were open to all students, were free and of uniformly high quality, it is reasonable to assume that the need for private schools and out-of-school tutoring would virtually disappear. It should be reasonable to assume that funds now used for these purposes could be diverted to public school support, though in the form of public school taxation.

The vocational high schools of Korea, which enroll slightly more than half of those students permitted to enter high school following graduation from the middle schools, are not, in the judgment of the study team, effectively serving the purposes for which they have been formed. Based upon assumptions about the potential for improved academic accomplishment at the elementary and middle school level, the study team recommends that responsibility for all post-ninth grade occupational training be consolidated under a single governmental agency and that this training should be directed exclusively to preparing people for specific jobs. These job training programs would be of variable duration depending on the training requirements, would be operated only as long as there were known manpower needs for the jobs in question, and would be open to qualified citizens of any age level. It is suggested that the vocational high schools of Korea should be an integral part of the job training program and cease to operate in their present form.

The study team recommends that the Korean colleges and universities and the academic high schools that feed them be maintained at their present rate of growth and improvement measures of an evolutionary and gradual character be undertaken in the future. These improvement measures would be of the kind ordinarily expected in the normal course of events. Based on projections of the Ministry of Science and Technology for manpower needs at the higher levels -- scientists, engineers, professional managers -- it may be appropriate for the Ministry of Education to reappraise the enrollment quotas for the various subject areas in the universities.

The highest priorities for extraordinary change and development for Korea for the next five years should be at the elementary-middle school level. It is believed that through a substantial, but feasible, effort in the development and validation of a significantly different kind of elementary-middle school that Korea can provide an educational program of demonstrably higher quality and relevance for all age-eligible Korean youngsters. Further, it is predicted that this program once developed and installed in the nation's schools will not only be cost effective, it will in fact cost less per student to operate than is presently the case.

The new school proposed by the study team would involve a number of changes from the present system. These include changing the basic instructional unit from its present class size form to a larger grouping, introducing individualized instructional concepts and associated materials, modifying the role of the teaching staff and increasing the ratio of students to teachers, and using programmed instructional television and radio.

It is proposed that the students will be organized into "instructional units" of 300 students with the average sized Korean school having three such units. Each instructional unit will become the responsibility of a four person teaching team whose functions will be differentiated and carefully defined in terms of what each team member contributes to the learning experience of the students. This will raise the student-teacher ratio from the present 55-1 to 75-1. It is proposed that the instructional unit (with 300 students and four staff members) will have permanently assigned to it six conventional classrooms. This would make an average student-to-classroom ratio of 50-1, down from the present 66-1. In order to get the learning group into sufficient space, the Korean government must face a socially and politically difficult decision, that of moving their schools to a double shift basis. Because of the self-study nature of much of the planned educational materials, the students will be able to do more learning in their homes or out of school. It should be possible to shorten the time in school for students without reducing real instructional time or learning achievement.

A basic recommendation of the study team is that the Korean elementary-middle schools be moved to a system of individualized instruction. The introduction of an individualized approach will have several benefits. It will be performance based, permit students to move at their own learning rate, and place a larger measure of responsibility on the student for self-direction of his learning experiences. It will also reduce reliance on direct teacher-to-student instruction.

The basic instructional resource for that portion of the curriculum to be individualized is a "student-learning unit," which will be prepared in modular and overlapping form and will be packaged for ease of storage and retrieval by students. These units should be sufficiently durable to have a use-life of four to five years. The student-learning unit will contain the behavioral objectives for the unit, critical instructional materials and directions to other resources not contained in the package, and formative criterion-referenced test items which will permit the student to assess his own progress through the unit. The principles of programmed instruction will be employed in the development of these units even though much of the instructional materials will not be programmed instruction per se.

Another feature of the proposed program is that the teaching staff will be differentiated in a manner that calls for professional staff with differentiated specialities. This should provide a better means for having the full range of competencies available in the instructional unit and make it possible to allocate different responsibilities to the individual professionals making up the team. The team functions will derive from an empirical analysis of the new learning program and will doubtlessly require that special training be given to the team. The teaching team will operate under the direction of a master teacher whose main job will be the management of the learning environment.

The study team proposes that a national educational radio and television distribution system be developed which will continuously transmit instructional programs during the school day. It is estimated that one and one-half to two hours of television instruction will be received by each student each day, comprising about one-third of the student's instructional day.

The type of television being suggested is one which couples the principles of programmed instruction with good dramatic television production to yield programs which are interesting and will teach youngsters who are widely varied in age and socio-economic background. Television sets can be made available, programming and maintenance capability exists, and a working prototype for central transmission and nationwide relay is in place. It is estimated that a functional national educational television system could be built and installed for $7.3 million including a television set for each instructional unit of 300 students plus an inventory of replacement sets for maintenance rotation. This television system will be an integral component of the system of instructional resources and will not be an "add-on" to the existing instructional program. It will be a form of programmed instruction developed to teach specific behaviors and will call for active responses from the student. Auxiliary printed materials will be developed to go with the ITV programs in which the students will write responses, solve problems and record reactions and questions. Student learning will be closely monitored and the teacher will be furnished supportive and supplementary materials to help her work individually with any students who experience difficulty or who fall behind in the televised instruction.

In the proposed Korean elementary-middle school it is anticipated that radio instruction will be used in the context of the individualized program and be one of the instructional resources to which the student is directed.

These are extensive changes that have been recommended by the study team in the educational processes for the Korean elementary and middle schools. Deciding upon the appropriate educational goals and operationally defining them into specific instructional objectives is a task of enormous importance to the future of Korea. The kind of individualized program being recommended by the study team will work best if continuous progress of each student is permitted. The ungraded continuous progress school will be facilitated by combining into a single school unit the elementary and middle school program. An important output characteristic of the proposed elementary-middle school program hypothesized by the study team is that, in addition to preoccupational preparation, all graduates will be as well prepared academically as today's high school graduate in Korea and will also be well prepared for further occupational training.

Vocational Education

The part of education about which Korean leaders, both governmental and educational invariably expressed the greatest concern was vocational preparation. The study team strongly recommends the addition, at both the primary and middle school levels, of a substantial offering in preoccupational preparation. The learning of the specific technical job skills needed in Korea's economy can then be readily acquired on a minimum training time basis. The graduates of the proposed nine year curriculum will have solid academic preparation, at least comparable to today's Korean high school graduates and will also be well grounded in the general fundamentals and prerequisites to specific job training. These changes will make the vocational-technical high schools as they presently operate obsolete and unnecessary.

What will be needed is a system of job training programs which will have the following characteristics:

A. The training will be exclusively related to specific jobs that will be available as students complete the training. Manpower needs forecasting will be essential for these purposes.

B. The programs, growing out of short range (two years or less) manpower needs predictions, will be of variable duration, the training being no longer than is minimally required to prepare the trainees for the available specific jobs. These programs would vary from four weeks to two years in length.

C. The system would provide for the start up of new training programs, with the shortest possible lead time, as needs change. By the same token, programs would be terminated as they were no longer needed.

D. These programs would be staffed with personnel who know the job skills being taught, with much less emphasis on degrees, teacher certification or other formal educational requirements.

E. These schools would not only train middle school graduates; they would be used for retraining of adult employees as personnel needs change.

F. There would need to be a very close liaison and coordination between the appropriate governmental agencies (MOE, MOST, OLA, etc.) and the private sector to maintain the optimum cybernetic relationships between training output and manpower utilization.

Evaluation

To optimize the adoption, effect and continued improvement of these innovations, it is necessary to develop an efficient appraisal and evaluation activity which will provide policy-makers and the public in general with information about the achievements, and problems which result from these innovations. Information for this evaluative function will be derived from the performance of individual students and various groupings of students. And at the component level, it must come from the performance of the various educational components which comprise the innovative pattern being proposed. Only by covering the range of information from the student to the component will the public and educational decision-makers be able to know the effectiveness with which the educational system is performing.

The purpose of evaluation is to provide information which will permit the continuing improvement of the educational process. Its scope should be systemwide, with a comprehensive role for evaluation at each level, ranging from tracking the progress of the individual student to assessing the preformance of the total system on a national (cor. it) scale. Evaluation should be based on systems performance with respect to the defined goals and objectives for Korean education. With education conceptualized as an input-process-output model, the data base for the evaluation system will be described in terms of the corresponding sets of data. Comprehensive evaluation of the developmental effort, therefore, will provide descriptive and diagnostic feedback for the planning and development, implementation, operation, and diffusion levels. Emphasis will be placed on evaluation at the student level, the component level, the school level and the systemwide or national level. The basic purpose of this evaluation is to provide adequate, valid and reliable information on performance assessment at each level so that the highest performance possible may be reached under the existing constraints. To create such a comprehensive evaluation system requires a series of activities. The first of these is a thorough review of the nature and intent of the evaluative systems currently in operation in the Korean educational system. The second is to expand the evaluation model outlined in this report into a detailed operational plan which is appropriate to Korean education, to the innovations being implemented, and to the formative requirements of these. The third step is the general process of testing and validation of the evaluation model. The fourth step is widespread implementation of the evaluative procedures. This evaluation system would help bridge the transition between the current system and the installation of the proposed system and facilitate the transition.

Development and Implementation

If Korean educational leaders conclude that the kind of elementary-middle school proposed by the study team is sensible for the nation and appears to be a desirable and viable alternative to the present educational condition, then several other questions need to be answered. The responsible government officials will need to know whether or not the proposals that appear to be good for Korea are also possible ? Are the various resources--people, money and time--available? What are these resources? How long would it take to develop such a system? How much would it cost to develop; how much to install nationwide; then how much to operate on a yearly basis?

The study team is optimistic that the key resource is available.

This resource is a group of aggressive, technically sophisticated educational researchers who are prepared to spearhead the effort. Additional support and technical staff would need to be prepared and this is feasible. These resource personnel will need an organization, under the Minister of Education, which is funded and mandated to undertake the development and validation of the new system. The study team has labeled this proposed organization the Korean Educational Development Laboratory (KEDL) and its responsibilities should include the design and tryout of the system and its components. With the Bureau personnel from the MOE and representative Korean educators it should reappraise the educational goals and objectives for the elementary-middle schools. It should develop definitions of desired learning outcomes at the various levels and then design and build the instructional programs to achieve these outcomes. These instructional resources -- student learning units, ITV, radio and teacher directed activities -- would be chosen in terms of their appropriateness to particular content and objectives in the curriculum. KEDL would be responsible for empirically demonstrating the instructional effectiveness of these new programs of learning, and would need to plan and develop a comprehensive educational evaluation system. The evaluation system should provide for assigning responsibility for student learning to the principle elements in the educational program, should provide for periodic audit of performance, and should permit system accountability.

The study team recommends that a three phase effort be undertaken: (1) development; (2) tryout and revision in a pilot community; and (3) nationwide dissemination. It is imagined that KEDL could best achieve the first two phases as well as continued improvement of the program through research, while the operating bureaus of MOE are best equipped to take responsibility for the third phase.

If the decision is made to build and try out the new educational system in a single community, the developers will need to keep in mind that eventually the system will be used nationwide and they should design to that end. Estimates are that it will take approximately four to five years to build and install the new system in a pilot community. Nationwide diffusion during the development phase could probably be accomplished in the same length of time, if the decision to go nationwide is made at the onset of the program. However, if the decision is made to take the program nationwide after the pilot system becomes operational (as the study team recommends), then an additional one to two years will be required for national diffusion. The cost of development and installation on a national scale is estimated to be approximately $16,000,000.00, while the same program installed only in a single test community will cost $6,445,171.00.

what about teacher training

The per student annual educational cost for the new system is estimated to be 9,819 Won. This would require an annual educational budget for the Korean elementary-middle schools of 80.5 billion Won if the 8.2 million age-eligible Korean children were all enrolled in the public schools in 1975. This is contrasted with the 104.9 billion Won required for the same number of children at the 1969 per student expenditure rate.

$31.00

CHAPTER TWO

METHOD OF INVESTIGATION AND ANALYSIS

The primary goal of this study was to develop useful and meaningful strategies for educational improvement throughout the Korean education system. Specifically the question addressed was, "Is it possible to provide a better, more relevant education for more Korean youngsters at a lower unit cost, and at a total cost not greater than the nation can afford?" Corollary questions were: "What would need to be done to achieve this ? What would it cost?" The selected strategies must, of course, delineate means of providing and arranging available resources, methods and technologies to emphasize and bring about the best instructional innovations for improving and expanding the educational program of the Republic of Korea. And these strategies naturally must be genuinely responsive to the social, cultural, economic and educational needs of Korea. To achieve this responsiveness, it was necessary to establish an approach and a set of procedures which emphasized thoroughness in the analysis of the Korean educational system.

where

The discussion of the methodology will be divided into two sections: the general features of the analysis and the specific procedures which were followed.

Systematic Approach

One of the most important features of the study was its development within the systems appraoch. This required identification of the characteristics of the educational system and its manners of operation (so far as these contribute to the system's functioning). Particular attention has been placed on the relative efficiency or inefficiency with which the system output is produced in terms of its stated goals and objectives. As a first step within this approach, it was necessary for the survey team to analyze the relevant, salient features of the system, the components of its operation, the various forms of resources it uses, and the nature of the products which it produces. It was also necessary to identify, in as much detail as possible, the various methods or processes through which the input is transformed into output, the stated intentions, and the nature of the statements of goals and purposes of the system.

Problem Orientation

The approach adopted in this study was focused on the analysis of the existing state of the Korean educational system, with the attempt to discover those areas where discrepancies existed between the intentions, objectives or goals of the system and its current performance. This problem orientation included both perceived and measured discrepancies, recognizing that not all of the system's performance problems were directly ascertainable within a study of this nature. (Some of them are perceived on an intuitable basis by the various operators or observers within the Korean educational system, but the exact nature of the discrepancy cannot always be made clear.)

Multiple Sources of Information

Within the course of this survey and analysis, general and specific information about a large number of features of the Korean educational system were gathered from as many different sources as possible. Extensive use was made of the written reports of various organizations such as the Central Educational Research Institute, the Korean Institute for Research in the Behavioral Sciences, Seoul National University, and other university organizations, and reports prepared for the United States Agency for International Development. Considerable use was also made of official Korean government reports such as annual statistical summaries of Korean education, manpower forecasts by various ministries, and long-range planning documents. Also of significant value to the survey team were documents prepared for USAID by the Midwestern University Consortium for International Activities (MUCIA). These documents included in-depth studies of school facilities, economic aspects of Korean education, manpower forecasts, potential value of educational technology in Korean education, and other topics, and provided a valuable background for the work of the survey team. Also, three consultants from MUCIA gave useful briefings to the survey team. (The various documents discussed here are listed in the Bibliography.)

? Much of the information gathered on the Korean system was obtained during probing, in-depth interviews. Members of the survey team, as a group and in subgroups, visited many government agencies, including the Ministry of Education, Ministry of Science and Technology, Office of Labour Affairs, Ministry of Communications, and others. Major universities such as Seoul National University and Yonsei University were visited. Meetings were held with political leaders and members of the legislative committee, such as Hak Yul Kim, the Deputy Prime Minister, and In Soo Yuk, Head of the Legislative Committee on Education. Former Ministers of Education were interviewed. A large number of research agencies and projects were visited, as well as a large sample of schools at various levels throughout Korea. Provincial boards of Education in Chungchong Pukdo, Chungnam and Kangwon Do provinces were interviewed.

The survey team then met periodically to pool and evaluate the information which had been gathered and to recast the questions. Through group discussion, the information and its sources were carefully examined to establish the probable reliability of the information. Attempts were made to eliminate biases, specious arguments and inaccurate information. When information provided by a source or person was found to be particularly deviant from expectations or reports from other sources, that information source was reexamined to ascertain the cause of the deviancy and the resultant information reentered for consideration.

It should be noted that much of the information gathered in this study was not impressionistic, but represented the most recent and reliable figures available within the Korean education system. Information from annual statistical summaries was considered, as was information from similar sources. Wherever possible, the authors attempted to base their considerations on such data. On the basis of evaluation, the survey team then went to new sources or returned to the original sources, testing the information, gathering new information, and attempting to formulate a concensus on various points or issues. For example, in order to establish the amount of money contributed by parents to their children's education, more than ten separate sources were checked and cross-checked. Statistical summaries, researchers and governmental sources were used to ascertain those figures which have been used. But because of the disparate sources of the information, the accuracy of figures is occasionally in doubt. When data provided by different sources varied even though they purportedly described the same phenomena (such as projected enrollments), the investigators opted for the central tendency, unless there were good reasons not to do so.

How large is the error in central tendency estimation, and what are the marginal effects on costs?

Limitations of Conclusions

The strength of the conclusions and recommendations drawn in this report are limited as a function of the reliability and validity of the information which has been gathered. Because of time constraints, the indeterminate nature of portions of the information gathered, the lack of available concensus on many issues and areas, and the rapidly changing aspects of some features of the Korean educational system, the conclusions and recommendations which have been reached in this report must of necessity be subject to considerable interpretation, or alternative conclusions and analysis. For example, it was not possible to assess fully the political and social feasibility of implementing a number of innovations considered within the report, nor was it always possible to obtain reliable information on key issues within the educational system. Notwithstanding these limitations, a balanced and thorough characterization of the Korean educational system has been attempted and realistic responsiveness has been a major objective in the formulation of the recommendations.

This report represents the team's findings, judgments and conclusions based on what it was able to learn in the available time. Some errors will be evident to the Korean educator and he is best qualified to judge where an informational error should lead to a modification in the team's conclusions or recommendations.

Specific Procedures

The Florida State University team operated under the direction of the USAID/Korea Mission Director and his designee while in Korea and worked in consultation with responsible ROK officials.

The Public Services Division, USAID/K, in consultation with the ROKG, made the necessary preparations for identification of the Korean professionals who worked as counterparts with the FSU team while they were in Korea. AID officials discussed the plans for the study and made the arrangements for logistical, clerical and professional support during the contract time.

The Central Education Research Institute (CERI) provided extensive services to the survey team. Office space and conference areas were provided for the team at CERI's facility. A secretary was assigned to work for the survey team. The Director and several top level researchers from the CERI staff made large portions of their time available to members of the survey team to answer questions, assist in locating research documents, make appointments with Korean educators and assist in other ways.

The team formed by FSU consisted of seven people whose competencies include educational economics, instructional technology, systems management, behavioral technology, educational administration and teacher training. Other consulting specialists in educational television and individualized instruction were used in the project on an "as-needed basis," both in Korea and in the United States.

The work of the team was divided into five segments: data collection, data analysis, establishment of objectives, development of alternative strategies, and preparation of the final report.

A. Data Collection

For the team to evaluate and plan educational change usefully and realistically, it needed a large variety of information. The information collection and compilation activities were partially accomplished by the ROK personnel involved in the study during prior to the arrival of the education sector analysis team in Korea. Types of information collected included:

1. Historical, cultural and educational data -- including institutional descriptions and including both formal and non-formal education and training
2. Demographic reports
3. Economic forecasts--including portions of GNP and Government revenues available for the education sector
4. Manpower requirements projection
5. Educational fiscal data--including recent portions of ROK budget devoted to education, and the allocation of education budget by level, and by major functions within each level
6. Summary of current ROK educational objectives
7. Attitudes toward education and educational changes by major special interest groups

8. Indicators of education attainments, such as graduates by level, passage at examinations, initial job placement and income of graduates by level, etc.
9. Flow of students through the system
10. Expenditures per student, per graduate, per teacher and by achievement indicator insofar as data is available.

Extensive use was made of surveys, data digests, research articles reports, etc., in these areas. But of equal or greater importance in the data gathering process was the extensive use of field observations, interviews and conferences with a broad range of Korean educators, government officials, businessmen, parents and students in Korean society. The remarks, observations, comments and suggestions of these people were invaluable. A general summary of many of the findings in terms of characteristics of the formal education system at the primary and secondary levels is found in an extensive report in Appendix A.

B. Data Analysis

The data gathered were analyzed with a view [illegible] establishing:

1. The likely future manpower outputs and cost implications of the current system,assuming no change in its direction
2. The anticipated cost-benefits to be achieved from innovations in various sectors of the Korean education system
3. The areas in which the system is presently producing the highest quality outputs most efficiently and economically
4. Strategies for introducing imaginative and purposeful innovations in policies, programs and practices for

improving the quality of the outputs at the lowest possible costs

5. Areas in which the system is presently producing the outputs least efficiently and economically

C. Definition of Objectives

In cooperation with the FSU team, ROK officials discussed the long- and short-term objectives of the Korean educational system. The objectives, both quantitative and qualitative, were examined in an attempt to determine the relative priorities of the objectives.

D. Development of Alternative Strategies

Relating the objectives and problems to the resources available, this report will recommend basic strategies designed to meet the national goals and objectives. The strategies take into account the following:

1. Various levels of economic growth.
2. Various levels of student enrollment in elementary and secondary schools, as well as vocational programs and higher education.
3. Various levels of funding and general resource support.
4. Various levels of unit costs per specified achievement level, indicating where productivity will be sought to reduce unit costs.
5. Various output models for various innovations.

The strategies provide for continuing experimental activities aimed at motivating the process of change by comparison and evaluation of efficiency of alternative measures,and self-renewal within the system. The strategies establish the necessary linkages to insure that more closely coordinated and connective practices can have an impact on the appropriate components of the educational sector. The alternative strategies proposed will include an estimate of the required costs in money as well as time as they bear on activities associated with the following major segments of education in the ROK:

1. Management and organization
2. Facilities
3. Teacher development
4. Equipment
5. Research requirements
6. Instructional materials development
7. Assessment of program effectiveness

Finally, the proposed strategies will make appropriate use and institutionalization of contemporary management program evaluation and review techniques to identify critical obstacles on the implementation path, and to evaluate the efficiency of measures implemented.

CHAPTER THREE

ECONOMIC AND MANPOWER CONSIDERATIONS FOR KOREAN EDUCATIONAL PLANNING[1]

This chapter of the report includes an overview of the current and projected state of the Korean economy with particular reference to its implications for short term manpower requirements and supply of labor stratified by occupational groups. A close look at organized education in the broader context of human development planning in Korea is followed by a critical review of the manpower requirements concept. A significant portion of this chapter is devoted to a discussion of the profitability of investment in human capital in Korea. Rate of return calculations to middle school, high school and college and university education is also presented. The empirical cost-benefit study will show that the continuing development of middle-school education in Korea is fundamental to economic progress.

A Brief Overview of Korea's Economy--1969 and 1970

With the successful implementation of the First (1962-66) and Second (1967-71) Five-Year Economic Development Plans, the Korean economy during the 1960's achieved remarkable industrial progress. The average annual economic growth rate, which stood at 5.3 percent during the 1950's, rose to 8.6 percent during the past decade and, notably, averaged 12.8 percent during the period 1966 through 1969. Korea's economic growth rate thus matches that of Japan, Israel and

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[1] This Chapter was prepared by Richard H.P. Kraft.

Nationalist China.

The economic planners recognize that sound sustained growth needs, above all, the maintenance of economic stability and an improved balance-of-payments position. In 1964, for instance, Korea experienced acute inflation and a foreign exchange crisis, mainly due to a high rate of investment in her development and a poor harvest. As a result, the nation's actual and potential savings were not being channeled into production but were being used to speculate in real estate and the like.

Recently, with the signs of excessive economic expansion becoming apparent, various measures have been adopted to bring down overhead activities, including the downward adjustment of the target rate for economic growth, a smaller increase in the scale of the budget, stricter control over credit, and firmer restrictions on imports of non-urgent and luxury items.

On the basis of the overall resources budget for 1970, a 10 percent economic growth rate, as compared with the 15.5 percent growth rate attained in 1969, is envisaged so as to stabilize the current rapid expansion trends. Moreover, the guidelines for the Third Five-Year Economic Development Plan (1972-76) set the average annual growth rate at 8.5 percent.

like inflation
of U.S. now

Such downward adjustments of the projected economic growth rates are considered essential for the elimination of the various factors leading to economic instability likely to appear in the course of dynamic development.

The national budget, which has played a leading role in the country's development, has continuously expanded under economic development planning. In 1969,total budget expenditures (including the general government sector and special accounts) increased by 44 percent over those of 1968, while the formation of private fixed capital expanded by 28 percent and exports of goods and services rose by 39 percent. Thus, government expenditures, which had to increase in order to remove such bottlenecks to economic development as lack of transportation and energy, did much to overheat the economy.

absolute or relative

In this context, the budget for 1970 gives stress to economic stability. The scale of the budget as approved by the National Assembly on December 22, 1969, is 661.5 billion Won, including the general government sector and special accounts, a 14 percent increase over that for 1969. This compares with the 44 percent increase in the scale of the 1969 budget over that for 1968.

Following this relative reduction in budget expenditures, 344.1 billion Won is to be collected in taxes, a rise of 31 percent over tax revenues for 1969, with the intention of suppressing consumption. Moreover, in order to increase public revenues and to encourage frugality, commodity tax rates on such items as automobiles, television sets and refrigerators were raised as of January 1, 1970.

with these increased tax rates [illegible] family [illegible] to [illegible]

Industrialization

In 1969 the gross national product (GNP) enjoyed a growth rate of 15.5 (13.3) percent. Mining, manufacturing and social overhead capital sectors shared the major role of leading the economic expansion, contributing much in the drive toward the goal of industrialization; per capita GNP at current market prices reached $195.00 (from $164.7), rising by 18.4 percent in real value terms. The general government

Table 3-1

Labor Force, Employment and Unemployment

(in thousand persons)

Classification	1965	1966	1967	1968	1969	1970	1971
Labor force	9,199	9,486	9,773	10,058	10,324	10,651	10,917
(Rate of Increase)		(3.1)	(3.0)	(2.9)	(2.7)	(3.2)	(2.5)
Employment	8,522	8,804	9,094	9,395	9,707	10,031	10,371
(Rate of Increase)		(3.3)	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)
Unemployment	677	682	679	663	617	620	546
(Unemployment Rate)	(7.4)	(7.2)	(6.9)	(6.6)	(6.0)	(5.8)	(5.0)

Source: The Second Five-Year Plan for Development of Science and Technology, 1967-1971. Government of the Republic of Korea, Seoul, July, 1966, p. 27.

budget increased from 261.7 billion Won (1968) to 370.9 billion Won.

Analyzing the economic growth by industrial origin, agriculture, forestry and fishery grew only 1.2 percent while mining and manufacturing grew by 26 percent, social overhead capital 30.1 percent and other services 11.7 percent. As a proportion to GNP, mining and manufacturing rose from 21.1 percent in 1968 to 24.0 percent and social overhead capital from 12.8 percent to 14.4 percent.

In ten years, the economic scale will have grown by 600 percent and the gross national product per capita will have increased by more than five times, to exceed the level of $800.00. This at least is the projection of the Ministry of Science and Technology, as expressed in their long-term plan for Scientific and Technological Development.

It is also projected that advance in industrialization will have increased the relative portion of mining and manufacturing industries in the total economic structure. Productivity in agriculture and fisheries will occupy a relatively smaller portion in the economic structure as urbanization continues. By the year 1986 then, scientific and technological resources will have increased labor productivity by 300 percent, and full employment should become a reality. really?

Planning Human Resource Development

It can be expected that the Korean labor force in 1971 will be increased to 10,917,000 people. It is also reasonable to expect that the unemployment rate will be decreased from 5.4 percent (1969) to 4.5 percent in 1971. In August of 1970, the total Korean labor force consisted of 10.65 million people. According to statistics of the Office of Labour Affairs 10.03 million people found employment during the first six months of 1970, while 620,000, or 5.8 percent of the total labor force, were unemployed. (See Tables 3-1 and 3-2.)

Table 3-2

Employment by Industry

(in thousand persons)

Industry Year	Total	Agr. & Fisheries	Mining	Manufac-turing	Constr-uction	Elec., Wat. & Sanit.	Trans. & Comm.	Com. & Others
1965	8,522	5,411	93	693	212	30	205	1,878
1967	9,094	5,619	104	820	274	37	237	2,003
1971	10,371	6,058	132	1,151	459	58	316	2,197
Annual Increase Rate	(3.3)	(1.9)	(6.0)	(8.8)	(13.7)	(11.6)	(7.5)	(2.7)

Source: The Second Five-Year Plan for Development of Science and Technology, 1967-1971, p. 28.

In order to round off this segment, a closer look at the employment pattern by industrial sector is significant. It is not surprising to learn that, according to estimates developed by the Economic Planning Board, employment in the construction field will show an annual increase of 13.7 percent between August 1970 and August 1971. The second largest increase, 8.8 percent, is estimated to take place in the manufacturing field, and transportation and communication follow in third and fourth place with 7.5 percent each. Only agricultural employment will show a decreasing trend by making only a 1.9 percent increase. For the educational planner it is useful to note that the proportion of total employment engaged in agriculture and fishery industries, which six years ago amounted to 63.5 percent, will decrease to 58.1 percent in 1971. The proportion in manufacturing on the other hand will increase from 8.1 percent (1965) to 11.1 percent in 1971.

The question whether the educational output in future years will match Korea's need for qualified manpower can only be answered if one cross-analyzes employment by occupational groups with the labor distribution by school years attended. According to data supplied by the Manpower Planning Section of the Economic Planning Board it can be assumed that so-called professional and technical workers will increase in number to almost 275,000 in 1971, or at an average annual rate of 9.6 percent, which will be the highest rate of change for expected manpower requirements. Table 3-3 shows the number of administrative workers, clerical workers as well as sales workers required in 1971 and it should be noted that in the area of clerical

Table 3-3

Employment by Occupational Groups

(in thousand persons)

Occup. Year	Total	Professional & Tech. Wks.	Administr. Workers	Clerical Workers	Sales Workers
1965 Actual No. (Ratio)	8,522 (100)	174 (2.0)	66 (0.8)	340 (4.0)	1,015 (11.9)
1971 Actual No. (Ratio)	10,371 (100)	274 (2.6)	80 (0.8)	476 (4.6)	1,235 (11.9)
Average Ann. Increase Rate	(3.6)	(9.6)	(3.5)	(6.7)	(3.6)

Occup. Year	Farm., Fish., Log. & Related	Miners, Quarrymen & Rld.	Transport. & Com. Wks.	Crafts., Prod. Process Wks. & Others	Service & Rld.
1965 Actual No. (Ratio)	4,968 (58.5)	77 (0.9)	180 (2.1)	1,126 (13.2)	558 (6.6)
1971 Actual No. (Ratio)	5,570 (53.7)	94 (0.9)	281 (2.7)	1,619 (15.6)	742 (7.2)
Average Ann. Increase Rate	(2.0)	(3.7)	(9.4)	(2.5)	(5.5)

Source: The Second Five-Year Plan for Development of Science and Technology, 1967-1971, p. 29.

workers an average annual increase rate of 6.7 percent is assumed.

Based on the previous data, it might be hypothesized that in Korea the most significant manpower shortage seems to be qualitative rather than quantitative. Recent educational attainment/ earnings profiles indicate that positions in industry are frequently occupied by persons not appropriately qualified; lower technical jobs are often filled by college or even university graduates. Frequently job holders have had an education which is unrelated to the particular job functions they perform.

According to data supplied by the Economic Planning Board it can be assumed that the labor group with zero to six school years, persons with only primary school education, will total approximately 8.5 million people in 1971. This constitutes an average annual increase of 3.3 percent. The population group with seven to nine school years will increase by 4.7 percent and will grow to 856,000 people in 1971. A higherannual increase, five percent, will be found in the population group having had ten to twelve school years, based on an estimated 675,000 people. The Economic Planning Board estimates that those persons with 13 or more school years will number 405,000 in 1971, with an average annual increase of 7.2 percent. It seems doubtful that this projection is realistic. Projections from the Ministry of Education indicate that the average annual increase to 1980 might be in the neighborhood of only 4.5 percent.

Important for educational planning is the fact that the educational profile of employed labor in Korea will be altered drastically, Employment opportunities for the group of people with only up to six school years will be decreased and the opportunities for those who will graduate from middle schools and high schools will grow, showing a dramatic increase. Table 3-4 shows the worker distribution by school years attended. The team suggests that perhaps the most significant shortage in manpower is qualitative rather than quantitative. To qualify this statement, there is obviously a general surplus of unskilled and semi-skilled labor; on the other hand, there is a large oversupply of college graduates from the general academic and humanities curricula. And it is not surprising to learn that there will be a significant surplus for near future demand in most of the high level professional and technical categories. The Economic Planning Board estimates that in 1971 the ten-to-twelve-school-years group will be comprised of roughly 28,200 persons It is interesting to note, however, that 116,300 persons will be the "output" of the present higher educational institutions. Also, there will be 29,400 persons in the group of 13-school-years-and-over needed in 1971 as against 39,600 persons who will be produced from present higher educational institutions. In other words, there is a surprising excess of university and college graduates for near future employment requirements. Table 3-4 gives manpower requirements by school years as estimated by the Economic Planning Board.

The demand for technical manpower

The Economic Planning Board estimates that technical manpower resources will consist of 979,000 persons in 1971, which is 9.4 percent of the total required employment of roughly 10.4 million people. Table 3-5 shows total employment and technical manpower resources in 1965 and 1971.

Table 3-4

Worker-Distribution by School Years Attended
(in thousand persons)

School Years Year	Total	0-6 yrs.	7-9 yrs.	10-12 yrs.	13 yrs. & over
1965					
Actual No. (Ratio)	8,522 (100)	7,051 (82.7)	669 (7.9)	519 (6.1)	283 (3.3)
1971					
Actual No. (Ratio)	10,371 (100)	8,433 (81.3)	856 (8.3)	677 (6.5)	405 (3.9)
Average Ann. Increase Rate	(3.6)	(3.3)	(4.7)	(5.0)	(7.2)

Source: The Second Five-Year Plan for Development of Science and Technology, 1967-1971, p. 30.

Table 3-5

Demand of Technical Manpower Resources by Industry

(in persons)

Industry Year	Total	Agr., Forestry & Fish	Mining	Manufacturing	Construction	Elec., Wat. & Sanit.	Other Services
1965							
Actual No.	609,000	60,000	38,000	315,000	8,000	9,000	179,000
(Ratio)	(100)	(9.9)	(6.3)	(51.7)	(1.4)	(1.6)	(29.1)
1971							
Actual No.	979,000	73,000	54,000	556,000	17,000	17,000	262,000
(Ratio)	(100)	(7.6)	(5.5)	(56.8)	(1.7)	(1.7)	(26.7)
Average Annual Increase Rate	(10.1)	(3.6)	(7.0)	(12.8)	(18.8)	(14.8)	(7.7)

Source: The Second Five-Year Plan for Development of Science and Technology, 1967-1971, p. 32.

Let's have a closer look at those roughly one million persons of technical manpower resources who will be required by 1971. At that time a total of 62,700 scientists, engineers, professionals, technicians and craftsmen will be needed, that is these will be "new additions" to the labor force. A breakdown of the new additions shows that next year (1972) 18,200 scientists and engineers will be demanded The present educational system, however, will turn out 29,000 people with these educational qualifications. Likewise there seems to be an over-supply of craftsmen, as the present educational institutions will turn out 49,800 trained persons, while industry and commerce will have openings for only 31,000 people with that level of educational attainment. Technicians, however, will be in short supply. Only 7,680 technicians, according to the projections of the Economic Planning Board, will be produced by secondary and higher educational institutions, whereas the demand calls for a total of 13,540 technicians, Planners in the Office of Labour Affairs as well as spokesmen of the Economic Planning Board are of the opinion that an adjustment of overall manpower requirement and supply will be made by transferring the surplus portion of scientists and engineers to the technician category and upgrading craftsmen through vocational training. Theoretically his idea is possible. In practice, however, this procedure is educationally inefficient and will cause some unemployment and underemployment. Manpower wastage through over-qualification can already be observed, that is, engineers are doing work at technician level and college graduates are engaged in routine clerical or sales work, Regarding the upgrading of skilled labor to do technician work, it is alarming to note that apprenticeship training, as well as inservice or on-the-job training, are extremely rare in industry except in a few large establishments located in Seoul and in the Ulsan district near Pusan.

The Economic Planning Board estimates that in the following year (1973) a total of 31,010 skilled craftsmen will be needed. Long-term projections indicate that there is a decreasing trend in the requirement each year and an increasing trend in the supply. Likewise, in 1971, 13,540 technicians will be needed. According to statistical data prepared by MOE only 7,680 technicians will be trained by appropriate institutions. As a matter of fact, it is estimated that between 1970 and 1975, 22,000 additional technicians will be needed. This shortage exists in all industrial fields except agriculture, forestry, marine and fishery.

A comparison of requirements and supply of craftsmen and required technicians by occupation shows clearly that some of the inconsistence in short- as well as medium- and long-range plans prepared by MOE, EPB and CLEP is largely a matter of semantics. At a time when thousands of engineers appear to be working as technicians, it is disconcerting to read that "the deficit of 24,000 technicians will be overcome by the transfer of 15,000 surplus scientists and engineers during the early years of the second five-year plan together with 9,000 from the craftsmen category who will have been given intensive vocational training."[2]

A major problem arises out of the needed adjustment of the requirement and supply of skilled labor and especially technicians. To simply state that the number of graduates from junior colleges and vocational high schools should be "adjusted," overlooks the difficulty inherent in the sort-term improvement of the quality of secondary institutions in order to meet the upgraded demands of a highly industrialized country. According to a spokesman of the Economic Planning Board, "appropriate steps" will be taken during 1971 to extend retraining to a minimum of ten percent of the total number of employed technicians, thus enabling them to upgrade their skill levels. Such retraining will be performed--at least this is the opinion of a spokesman of MOST--under the in-service training programs of individual industries. A potential weakness of this approach must be recognized when one looks at the incidence of such in-plant training as was available in the past. In-plant training in Korea, as has been pointed out, is extremely rare. These down-grading and up-grading practices should be recognized for what they are--emergency measures--not long-range solutions. The long-range solutions must be found in reordered educational priorities in the schools of Korea.

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[2] The Second Five-Year Plan for Development of Science and Technology, 1967-1971, p. 42.

Education as an Investment

The manpower requirements approach appears to have lost some of its momentum. The failure or refusal to respond effectively to educational and economic purposes, and the reluctance to question established practice has contributed to a diminishing credibility in the manpower requirements approach. This mindlessness is not the monopoly of individual "flying manpower specialists"; it is diffused remarkably and evenly throughout many developing countries whose educational leaders find it hard to believe that manpower criteria may not always be appropriate guides to educational planning. But countless specialists in the educational planning field have argued for a long time that manpower requirements models which ignore the costs of educational policy relative to expected benefits are inappropriate (Cash, 1969).

The main limitations of the manpower requirements approach are inherent in the implicit assumption that the elasticity of demand for labor in a country is inelastic. That is to say that the amount of different kinds of labor required in the future will not adjust itself to changes of the wage level. Furthermore, as critics point out, the implementation costs of educational plans are often ignored. The method typically used in manpower education planning is to attempt to

> "meet the production and consumption targets specified in the economic development plan, although no comparison is actually made between the benefits and the costs of the educational policy. The problem is that, without such comparisons, any educational policy can be seen to be consistent with development objectives, irrespective of its real cost to society." (Chirikas and Wheeler, 1968)

Since this approach ignores costs, manpower planning is only a partial method of analysis. It may be true that employers will need workers with specific skills, but are they willing or able to pay for them? Manpower planners have often been guilty of identifying shortages and proceeding to train the appropriate number of workers regardless of cost. However, decisions to train additional workers or to expand educational facilities under conditions of scarcity require the balancing of costs and benefits (Kraft, 1969).

There is also the long-range problem of technological change which alters the need for various types of trained people. As seen in the past decade, the need for certain occupations has been eliminated entirely. To some extent the more technically progressive firms and industries may be used to guide future projections, but even these will not provide a complete picture. If men are trained to be flexible among jobs, the problems incurred by technological change may be lessened in part and men will be able to alter their occupations with a minimum of retraining.

Economists who have taken an increasing interest in education over the last ten years, are in complete agreement with Beeby, who states that the entrance of economic theory into the realm of education has been profitable because:

> "The economic approach is an excellent means of encouraging education to move closer to reality, as so many educators have for long been demanding; the scientific methods of economics bring them a degree of precision which has a happy effect on educational discipline economics ,by demonstrating scientifically that education can be investment as well as consumption, offers a conclusive argument to induce society to accept an extra financial effort in favor of education." (Beeby, 1966)

It is in this area where the manpower approach fails. It is a well-publicized fact that in the past years in Korea the economic plans always came first. Educational plans were prepared only after the general economic targets were set. But education, which is development of human capital, cannot be isolated from society, culture or economics. And educational plans which consist mainly of manpower projections are bound to fail as they overlook the fact that education has repercussions on all activities related to the development of a growing society.

Rather than being confronted with a general manpower shortage, Korea has the more pressing problem of predicting what the future growth of technology will be and what general implication this growth has for its human resources development efforts. There can be no doubt that technology will change, just as world markets and the mix of Korean industry will change. In Korea, where considerable resources are being devoted to improving technology, technology is expected to advance rapidly with corresponding increases in human productivity and modified human resources requirements. In view of this future for new technology and the concomitant, predictable growth of knowledge and the further implication of these changes for transfer of knowledge through the educational processes, even the most sophisticated statistical projections of manpower demand and supply seem to be rather meaningless. For example, who would have predicted in 1948 that by 1968 the United States would employ a quarter of a million employees in the television industry?

The foregoing remarks should not be interpreted as advocating that no projections should be made. After all, educational plans have to be based on some quantifiable ideas of what the future is going to be like. What the study team cautions against is the establishment of a more or less artificial "link" between educational output and future so-called manpower needs. While educational planners, mostly in developing countries, still rely heavily on quantitative manpower forecasts, it is well documented that the movement of the past few decades has been away from the quantitative manpower concept of directed or forced human resources toward a social demand approach which attempts to organize human capital through economic market forces.

It is interesting to note that long-range manpower projections for Korea have been made although no systematic current information about labor supply and demand by various industries and occupational groups are available. Nor were there any manpower requirement and supply data on an area basis available, and long-range planning of manpower utilization becomes somewhat suspect.

It is not surprising that several consultants of U.S. AID have realized this shortcoming and have recommended that specific types of background research are needed to give any depth or substance to knowledge about manpower, education and training. The following are some of the major fields in which research is needed and which have been recommended previously.

> "(1) The feasibility of labor-intensive production in industry and public works; (2) post-graduation experience and utilization of graduates of professional and technical curricula in colleges and high schools; (3) relative cost and effectiveness of various approaches to technical and skill training; (4) labor productivity in small, medium and large enterprises in relation to working hours, working conditions and incentives; (5) the structure and nature of unemployment and under-employment, urban and rural; (6) rural-urban migration and its consequences." (McVoy, 1965)

In April 1966, Hollander, in his report entitled "The Role of Manpower in Korean Economic Development," wrote that the long-run development of Korea's manpower will depend on what is done to "cultivate its quality as a labor force." He postulates: "so far as education is concerned, the major strategic consideration in manpower development should be the strengthening of secondary education, both academic and technical, and the focus on vocational education and training on the particular tasks of the second five year plan."

He also states that:

"...raising the productivity of the labor force will require

> a continuous syphoning off of the large portion of the rural labor force which is redundant to the requirements of Korean agriculture, and re-allocating them to productive uses in the non-agricultural sectors. As has often been pointed out, this large labor force is consuming (though at a low level) without adding anything to the country's product, whereby depressing the average level of living of the entire population. It seems evident that substantial increases in productivity in agriculture can be achieved by more intensive cultivation of the land without requiring more than a small fraction of this redundant labor force. One of the major objectives of a strategy for manpower development is to channel this labor into productive non-agricultural activities--in or near the rural areas to the extent that this is practical, or to provide employment in the towns and cities. The net cost of this labor to the economy will be small and the net gain of converting this redundant labor force into profitable productive uses will be correspondently great." (Hollander, 1966)

Beyond the Manpower Concept

Seventeen years ago, at a Conference on the Utilization of Scientific and Professional Manpower at Columbia University, Kenneth E. Boulding shocked his sophisticated audience with the statement that he found the whole manpower concept repulsive, disgusting, dangerous and "incompatible with the ideals of liberal democracy" (Boulding, 1968). In defense of this extreme position he argued that the "manpower abstraction" is appallingly crude, and that any attempt to think of the problem of allocation of human resources as if it were simply a matter of counting noses, misses most of the realities of the case. He concluded that the implications for education are that the educational system should "plan for surprise." Of course, we do not advocate here that educational policy should neglect predictions or projections. After all, population projections constitute a necessary tool for educational planners. And in an already developed country, where it is possible to project into the future as there are reasonably stable parameters in the past, this reliance seems to be justified. In developing countries, manpower projections can be completely erroneous because of a sudden change of the technical and technological parameters of the economic system. While the more qualitative aspects of technological change,such as the shift from textiles to electronics, will be felt immediately, changes in the rate of growth of productivity might not be felt for a few years, and then the effects will be noticeable only in unexpected gains or declines in the unemployment rate and in the growth of national income. The central question for Korea is to what degree will a changing technology and changes in the demand-mix alter the profile of the manpower projections. Referring to a second difficulty,Samuel Bowles writes that it is almost impossible to simultaneously identify both the demand and the supply functions for educated labor. He states that "even if labor markets are in equilibrium, the data on labor inputs represent the intersection of a demand and supply schedule; we are unable to distinguish whether the estimated 'requirements' are determined by demand or supply." (Bowles, 1969)

The study team, which favors the rate-of-return approach to educational planning, is of the opinion that the manpower requirements approach as applied to the Korean educational system and economy is not adequate. It is feasible to use economic growth forecasts or "targets" to predict the sectoral distribution of output and employment in some future year. It is another story, however, to convert

the sectoral distribution of employment to an occupational distribution of the total labor force, And to make long range forecasts of the distribution of the labor force by level of schooling as computed from the distribution of workers by occupation is another impossibility, This general method of educational planning,which is to use the estimates of required numbers of workers, stratified by educational level, in conjunction with data on existing stocks and expected retirement rates, to generate a plan of necessary enrollment levels in various types of educational institutions,has been used frequently in developing and semi-developed countries, However, most planning attempts of this type turn out to be far from satisfactory
because of data limitations only
(Hollister, 1966),

In recent years the burden of financing public education has increasingly been carried by the federal government and thus, Korea's formal education has to a large extent become a publicly controlled service, Planning of education should be increasingly recognized as an integral part of national development planning, The impact of formal education will be more or less effective, depending on whether its share of investment is consistent with its significance in relation to other economic needs, In Korea, the view has been accepted that formal secondary and higher education have multiple functions to perform , one of the main functions being the creation of well-educated people, educated and trained to adapt to a changing economic situation, All types and levels of formal education, especially the secondary level, are thus considered a form of investment in the infra-structure of the Korean society and economy, But education is not a short-term investment. It is an investment with its returns delayed for ten to twenty years, a fact which frequently is overlooked by economists who engage in manpower assessments. After all, it appears to be relatively easy to use an economic plan for the design or layout of an educational system. Projected rates of growth and directions of growth can be calculated and long-term manpower assessments will yield endless joy for the manpower planner. Frequently, however, these planners overlook that their projections at best can only be approximate. And to go one step further: quantitative long-term manpower planning in its present form is obsolete if not dangerous for planning purposes of a developing country.

In view of the present economic situation as well as on the basis of various short-term manpower forecasts, it can be expected that a quantitative expansion of educational institutions, for the purpose of increasing the number of students beyond the current supply capacity of human resources, will generally be restrained in coming years. The techniques of short-term manpower forecasting used in the Ministry of Education and in the Economic Planning Board are reasonably good, and they generally agree that the projected number of graduates from higher educational institutions will exceed the requirements for economic development. It is extremely interesting to note that based on these quantitative forecasts both agencies agree that new investment to increase the numbers, why not where are the students of students over present levels may be a waste. Later in this chapter an empirical study on the profitability of investment in various levels of education in Korea will be discussed. It shows that the so-called rate-of-return from college and university education is lower than the return from high school and middle school education. As a matter of fact, the rate of return from middle school education, 20.0 percent, is the highest.

If we subscribe to the assumption that investment in education is as important to economic development as investment in physical capital,it can be argued that: (1) the quantity of schools may be sufficient in the next two to three years, but the quality of human resources produced by existing middle and high schools can reach neither the level for which the purpose of these institutions is intended nor that required for occupational requirements; (2) emphasis has to be placed on quality improvement of secondary education through re-enforcement of teachers, improvements of educational facilities, introduction of educational technology,and curricular improvement; (3) as investment in education competes with investment in physical capital in the allocation of available scarce resources for the purpose of increasing economic growth, it seems prudent to invest more in middle schools than in other levels of Korean education.

Against the background of the manpower requirements approach to development problems in Korea~~,the idea~~ that education can be treated as investment takes on the character of a discovery. And the basic practical and political evaluation inherent in this new approach is illustrated by the following comment of Theodore W. Schultz:

> "When poor countries . . . enter upon the process of developing a modern agriculture and industry, with some notable exceptions they invest too little in human capital relative to what they invest in non-

> human capital; skills and knowledge useful in their economic endeavor are neglected as they concentrate on new plants and equipment. Thus, an imbalance arises and as a consequence they fail, often by a wide margin, to attain their optimum rate of economic growth." (Schultz, 1962)

And it should not be forgotten that the question whether or not education can be treated in financial terms as investment has been solved long ago. In fact, hardly anywhere in the world in the last years has there been any discussion of economic development that did not give educational improvement a predominant role. Regarding the "late arrival" of the rate-of-return approach,one writer observes: "It might seem somewhat surprising that such a common-sense hypothesis (that education can raise productivity of workers) should not have been accepted by economists until quite recently." (DeBeauvais, 1962)

The Rate of Return to Education in Korea

Cost-and-return analysis in education is not new. What is new, however, is a systems approach to cost-benefit analysis. This comprehensive view encompasses three functions of cost-return analysis: first, educational expansion must have regard for other social or economic objectives of national development; second, scarce resources must be allocated between different levels and types of the formal educational system ; and lastly, in order to achieve effective utilization of its teaching force, efforts should be made in Korea to change the present labor-oriented secondary educational system to a more capital-oriented system.

Today, the existing educational plans make hardly any allowance for an accurate regional breakdown of educational cost. But regional costs are extremely important as they can serve as a basis for equalizing educational opportunities in Korea as a whole and for promoting types of education and training which are deficient in individual regions. It is important to remember that the market for skilled and scientific personnel is a national one,

A close examination of educational expenditure and benefits by level and type of education comes next. Such cost and return studies, done periodically, could provide a useful guide to policy in Korea. After all, the bulk of all educational expenditures goes to primary education and, in terms of cost per student, Korean primary education seems to be rather inexpensive. And while our study shows that the return to education is highest at the middle school level, it should not be overlooked that there is little point in expanding an educational system which is ineffective and inefficient, First, the weaknesses have to be remedied and our suggestion is that this be through the introduction of educational technology and innovations.

Educational Expenditure as an Investment. An interim report on educational financing in Korea by Professor LeRoy J, Peterson contains a chapter on educational expenditure as an investment. The chapter is sub-divided in parts discussing cost-benefit studies in the United States and cost-benefit studies in Korea. The reader is referred to these sub-chapters as they describe in detail the extensive volume of literature and research on this subject. Regarding the cost-benefit studies in Korea, Professor Peterson refers to three recent studies which have been directed specifically to determine the economic benefit of educational expenditures in Korea,

Professor Peterson concludes:

> "Since the return on the educational investment in Korea is of vital importance, the findings of the (above) studies should be reconciled. The question of the economic return on the educational investment is of sufficient interest in educational finance and for public policy to require specific answers." (Peterson, 1969)

A cost-effectiveness study of particular relevance to Korea because of current emphasis given to vocational-technical education is an examination of private and public costs and utility aspects of vocational-technical education programs offered by area vocational-technical schools in the United States. This study was conducted by Richard H. P. Kraft and investigated social and economic factors in the following areas:

1. the degree to which graduates of selected vocational-technical programs assume occupational earning levels in business and industry for which the objectives or the programs were designed;
2. the public and private economic costs per student of the programs;
3. the cost-utility model as a conceptual tool for the design and implementation of a planning, programming, budgeting system.

lower among types of programs.

Two aspects of utility were considered: (1) the utility of programs in terms of monetary return on investment to the public or society; and (2) private monetary returns to an individual graduate of the programs.

The final sets of calculations involve the computing of cost-utility ratios between: (1) private costs and utility; and (2) public costs and utility (Kraft, 1969).

Review Rand Study on Vocational Ed in U.S. - Negative C B private + social in the aggregate

Findings

Private Rate of Return. The 1969 graduate of selected programs (Electronics Technology) invested approximately two years of foregone earnings and direct costs totaling $5,815. In return, he received average earnings of $2,313 greater than he would have had he continued as an unskilled manufacturing worker.

These two factors are used in the computation of a cost-utility ratio which yields a figure useful for comparison of the program's relative effectiveness over previous years and relative utility value, limited to the monetary aspects, with other educational programs. The 1968 graduate yields a cost-utility ratio of 2.51. This ratio number is also equivalent to the number of years it will take the graduate to receive a return of $5,815 or "total return" on his investment. This rate of return assumes that the graduate has no further increases in earnings during the 2.5 year period following his graduation. Since this is a rather weak assumption in that the graduate will more likely receive pay raises during this time, the rate of return is probably conservative.

Public Rate of Return. The return to the public on its investment in vocational-technical education programs was also raised as a question for investigation in this study.

The public (or society) invested $1,597 over a period of two years in a 1968 graduate's program. For this investment the public received in the form of additional taxes paid by the graduate during this first year of employment $548. The cost-utility ratio indicates a period of less than three years in which the graduate will return society's investment of $1,597, assuming that the graduate has no increase in earnings during this time period. Again this assumption being unlikely, it would be expected that the graduate will return the investment to the public in an even shorter period of time. The public rate of return of 34.3 percent is also based on the first year earnings after graduation.

Another important result of the research was the verification of the theory that cost-effectiveness procedures allow the forecasting of the costs of new programs over a period of years. Many mistakes have been made in the past because of a failure to take into account the cost, in future years, of programs that are attractive superficially, but that, eventually, prove to be bad educational investments.

Cost-effectiveness procedures can be valuable in determining benefits that may accrue from the more efficient utilization of vocational-technical school facilities by the use of the facilities after hours for adult education or other programs, or through the lengthening of the present school year. In Korea, only one cost-benefit study has been specifically directed toward determining the economic returns to education. The research was completed in September, 1968 (Kim, Kwang Suk, 1968).[3]

Rate-of-return estimates of investment in education in Korea

An important question entering into the discussion of the rate of return is the purpose for which the cost-benefit calculation is wanted. If one wanted to calculate the private profitability of investment in educational training then benefits should refer to earnings after tax and cost should refer to private costs only. On the other hand from society's point of view educational benefits refer to income before tax,and cost should include all outlays related to education. Also on the cost side we will have to differentiate between direct costs and indirect costs. While direct costs refer to outlays for schooling purposes, such as tuition fees paid by individuals, one has to take into account total schooling costs when the social estimation of the rate of return is wanted.

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[3] Two other projects are still in draft form and will be subject to modification (Chong, Keun Bae; Moon, Yong Lee). In their present form they have limitations due mainly to methodological procedures.

It will be useful to differentiate between the ex-ante and ex-post application of rate-of-return analysis. In organizational terms this means that cost-benefit comparisons are being undertaken before, and corresponding evaluations after, the implementation of a new educational model. Such analysis will indicate whether it would be economically meaningful to substitute capital for labor in the educational transformation process. Given one measurable type of educational output, the calculation of costs and benefits by detailed analysis of educational inputs and of different input combinations can then indicate the most efficient combination.

For this portion of the paper the study team has relied heavily on the Statistic Year Book of Education, published by the Ministry of Education, to the Report on Wage Survey, 1967, published by the Bank of Korea, Seoul, and on the 1960 Population and Housing Census of Korea published by the Economic Planning Board.

It has been acknowledged that people with a higher level of education usually enjoy the benefit of higher life-time earnings. In other words, a college graduate usually earns more than a high school graduate and the earnings of a high school graduate are higher than those which a middle-school graduate can expect. One limitation of the rate of return approach is the difficulty in estimating to what extent the extra income is due to education alone. After all, frequently the earnings level depends on variables such as parents education, type of occupation and last but not least the region where employment is found.

The tendency of educational training to raise the productivity and hence the earning capacity of students is one and only one of the objectives of the educational process. It should not be overlooked that this vocational objective is of declining importance in advanced countries. In Korea, however, the question of raising the productivity is of prime importance. ? As a matter of fact, the teams study assumed that the difference in earnings between better educated and less educated groups in Korea reflected the difference in their respective productivities. Did the team prepare a study? i.e. is this assumption only supportive of the high quantity of vocational schools?

As earnings of an individual have the tendency to change with his age, the number of years of employment and experience and unemployment trends were taken into account.[4]

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[4] The team hastens to add that they do not underestimate the cultural value of education. After all, there are numerous different objectives of education such as cultural benefits, for instance, which usually are excluded from cost-benefit evaluations. The reasons for these restrictions are obvious: it is extremely difficult to measure other benefits than those which are of a purely economic nature.

A comparison of data supplied by MOE and CERI as well as data found in the Statistic Yearbook of Education 1969 indicates that there seems to be a general agreement as to what constitutes in-school expenditures. For out-of-school expenditures per student, however, special estimates were supplied by CERI. It is interesting to note that these estimated annual out-of-school expenditures differ to quite a degree from those which were used by Kwang Suk Kim in his cost-benefit study in 1967. Our data (Table 3-6) shows that total direct education costs per student, including both in-school as well as out-of-school expenditures amounted to 14,800 Won for primary school pupils in 1969. The total direct education cost for middle school students was 30,600 Won, for high school students 44,100 Won, and for college and university students 146,500 Won.

Earnings by Level of Education

In order to calculate earnings by levels of education, we used the Bank of Korea's Report on Wage Survey, 1967. Data for 1969 was derived at by adjustment of the 1967 tables. In discussion with the CERI staff and with economic advisors of the Bank of Korea the team gaine the impression that Korea's labor market can be classified as competitive in nature. There is a high rate of mobility among middle school and high school graduates who entered the labor market to become employees especially in the following fields:

a. manufacturing

b. mining

c. utilities

d. primary school teaching

Table 3-6

Total Education Expenditure per Student - 1969

	(in Won)	
Primary School	14,800	$47.43
Middle School	30,600	98.07
High School	44,100	[redacted] 141.34
College and University	146,500	469.58

Exchange rate 2/72 = 372.8
69 = 312

e. middle school teaching

f. high school teaching

This qualitative input was highly important for us, as we based our cost and return study on the assumption that earnings data from these areas reflect average earnings of employees with similar education and attainment in other sectors of the Korean economy.

Table 3-7 shows the earnings profile by education and working field, 1969. Monthly cash earnings of mining industries workers were multiplied by 114.8, since the Bank of Korea survey indicated that fringe benefits were 14.8 percent of monthly cash earnings. And annual special earnings by duration of service have been derived by applying the average ration of annual special earnings to monthly cash earnings.

Finally,the annual gross wages were then used to derive the estimated lifetime earnings by level of educational attainment and by duration of service.

Regarding the earning profiles, the team decided against adjusting the earnings data according to the present market conditions. However, if unemployment happened to be high, relative to standards established in previous years, then one should adjust downward the earnings differential. The rationale for this, of course is that people with less education are represented to a higher degree in the pool of the unemployed thus lowering their expected lifetime income.

The Cost of Education

The private cost to an individual (C_i) was determined by

Table 3-7

Monthly Earnings by Education and Working Field 1969

(unit: thousand)

	Mining Industries Worker 1/ 5/		Manufacturing Industries Worker 2/ 5/		Electricity Worker 3/ 5/		Pri. Sch. Teacher 4/	Mid. Sch. Teacher 4/	High Sch. Teacher 4/
Total	16.3	(10.2)	13.0	(8.1)	29.4	(18.4)	20.8	26.5	27.6
Primary (1-6)	13.4	(8.4)	9.1	(5.7)	29.0	(18.1)			
Middle (7-9)	17.1	(10.7)	11.7	(7.3)	27.5	(17.2)			
High (10-12)	20.6	(12.9)	17.3	(10.8)	29.4	(18.4)			
							20.8 6/		
College & Univ. (13-)	34.6	(21.6)	30.4	(19.0)	31.4	(19.6)		26.5 7/	27.6 7/

* Included are Regular and Extra earning (Not in teachers' earnings)

1/ The Bank of Korea, Report on Wage Survey 1967, BOK. p. 65.
2/ " " p. 93.
3/ " " p. 246.
4/ M.O.E. FY 1970 Revenue and Expenditure Budget by Specific items, M.O.E. pp. 1080-84.
5/ ( ) Multiplied by 160, because of every year 30% wage increased 1968 and 1969 based on 1967.
6/ The majority of primary school teachers graduate from junior teachers colleges.
7/ Middle school teachers and high school teachers graduate from universities and colleges.

$$C_i = E_i + F + B \pm S$$

in which E_i represents foregone earnings, F - the fees paid by the student, B - the cost of his educational materials and S - the cost of his miscellaneous supplies.

An estimate of the earnings a student foregoes while enrolled in various programs is based on:

1) Mean hourly earnings of skilled labor in general manufacturing for the areas served by the schools for 1967 and 1969;
2) Extrapolating percents of increase in earnings for the five years previous to Bank of Korea's Report on Wage Survey, 1967; and
3) Computing the total foregone earnings for the mean time period, that is the total number of school terms a graduate would be enrolled. The cost of books and miscellaneous supplies was determined from records kept by CERI. It is assumed that the cost of traveling to and from schools is equal to the cost of traveling to and from a job.

Public Costs

The annual educational expenditures per student by different levels of school, 1969, have been broken down into in-school expenditures and out-of-school expenditures. The in-school expenditures are comprised of national education expenditure, the expenditures local governments spend for their public schools, expenditures for private schools, PTA allowances and expenditures for experimentation and R & D. The out-of-school expenditures, which totaled almost one billion Won in 1969, are the type of educational expenses that students have to bear. Here we find costs for textbooks, learning materials, stationery, special activities in schools, various tests to be taken, school health, transportation, uniforms and the cost for tutoring or outside studies. (See Appendix D.)

The next step of the team's survey involved combining this data to derive cost and earnings differentials by levels of education (shown in Table 3-8). It is assumed that graduates of primary schools have earnings during their fourteenth year of age. For middle school graduates, high school graduates and graduates from colleges and universities, the team assumed that the stream of future earnings start during the first year after graduation. The staff of CERI agreed that age 65 can be considered as a "normal" retirement age for Korean males. For a detailed explanation of Table 3-8, the reader is referred to the footnotes which explain the profile and contents.

We now have enough information to calculate the first rate-of-return estimates. The information needed is contained in columns 1, 2 and 3 of Table 3-8. Column 1, for instance, results from calculating the net earnings due to middle school education, that is the difference in expected earnings between primary school and middle school graduates. Likewise, column 2 shows the net education cost (or net excess of income) of a high school graduate as compared to a middle school graduate, and in column 3 the education costs and the stream of net earnings of college and university graduates were compared with those of high school graduates. No foregone earnings were assumed for males thirteen years old or less.

Table 3-8

Cost and Earnings Differentials by Level of Education
(in thousand Won per annum)

(A) age	(1) NEm(NCm)	(2) NEh(NCh)	(3) NEc(NCc)
12	(-30.6)		(-30.6)
13	(-30.6)		(-30.6)
14	(-129.0)		(-129.0)
15	0	(-167.4)	(-167.4)
16	23.9	(-191.3)	(-167.3)
17	-27.2	(-191.3)	(-218.5)
18	40.8	-35.1	(-320.9)
19	40.8	2.0	(-320.9)
20	40.8	2.0	(-320.9)
21	40.8	74.8	(-320.9)
22	40.8	74.8	153.1
23	40.8	74.8	219.9
24	40.8	74.8	219.9
25	103.1	-54.8	263.9
26	103.1	-54.8	263.9
27	103.1	-54.8	263.9
28	103.1	148.3	263.9
29	103.1	148.3	263.9
30	103.1	148.3	263.9
31	103.1	148.3	263.9
32	103.1	148.3	495.7
33	103.1	148.3	495.7
34	106.9	148.3	499.5
35	187.7	67.5	499.5
36	187.7	67.5	499.5
37	187.7	67.5	499.5
38	187.7	130.1	499.5
39	187.7	130.1	499.5
40	187.7	130.1	499.5
41	187.7	130.1	499.5
42-65	187.7	130.1	300.5

(1) NEm(NCm) = Net excess of income or net education cost (in parenthesis) of a middle school graduate as compared to a primary school graduate.

(2) NEh(NCh) = Net excess of income or net education cost (in parenthesis) of high school graduate as compared to middle school graduate.

(3) NEc(NCc) = Net excess of income or net education cost (in parenthesis) of college graduate as compared to high school graduates.

The following formula served to calculate the difference in expected lifetime earnings between graduates from middle schools, high schools, and colleges and universities.

$$(1) \quad \sum_{i=1}^{n} \frac{B_i}{(1+r)^i} = \sum_{j=1}^{m} C_j(1+r)^j$$

Where B_i = i^{th} year difference in expected lifetime earnings between higher educated and less educated persons;

C_j = j^{th} year cost (total cost) of education, including foregone earnings and experience;

$i = 1, 2, 3, 4, 5, . . . n$, number of working years

$j = 1, 2, 3, . . . m$, number of years of school attendance

r = discount rate

In making this calculation,one seeks to equate both sides of the equation. Thus, by iteration you find the internal rate of return (r), or discount rate, which equates the present value of extra lifetime earnings attributable to extra amounts of education with the present value of the costs of the additional education. In solving (1), given the values of B_i and C_j, the values of r that will equate the left hand side of (1) to the right hand side are searched out in steps of 0.0001 and r = 0.2000.

It is assumed that the internal rate of return will not be larger than 25 percent. The computations were performed at the Korean Institute of Science and Technology, Seoul, on a CDC 3300 Computer.

Table 3-9 shows the Rates of Return on Education as calculated by the team. The findings indicate that at the high school level the rate of return (11.2%) is almost of the same magnitude as the one for college and university graduates (9.5%). The rate on middle school

Table 3-9

Rates of Return on Education in Korea

	Rate of Return
Middle School Education	20.0%
High School Education	11.2%
College and University Education	9.5%

education, however, is noticeably higher (20.0%) and exceeds the other rates of return by almost 100 percent. averaged

It is interesting to compare the rates of return for investment in education in Korea with the rates of return on alternative investment opportunities. A cursory look seems to indicate that the return on education compares favorably with the return on investment in physical capital. According to a spokesman of the Bank of Korea, the yield on investment of physical capital was estimated to be in the neighborhood of 18 percent in August 1970. It would be misleading to conclude that in Korea the early stage of education appears to be extremely profitable, as it is in the neighborhood of returns observed for physical capital. The return to higher educational levels appears to be relatively low.

The cost-benefit analysis which we have been carrying out indicates that the social and private rate of return of middle school education is high in comparison with other investments. Education has, however, other objectives besides being an economic investment in human capital. And certain extrinsic goals, such as social, cultural and political, should be considered in future rate of return studies. Technically these goals could be quantified and the numerical indicators could become the required weights which one would apply to the educational output.

Concerning the interpretation of the rate-of-return profiles which have been constructed, it can be said that they have noteworthy implications for the Korean government and top level decision makers in the educational field. For example:

a. The rate of return of educational investment at middle school level is astonishingly high.

b. If monetary indices are accepted as a measure of effectiveness and productivity, then, given the excellent performance of graduates of middle schools in the labor market,extra public funds should be directed toward this level in order to maximize private and public benefits.

In other words, along with concern for earnings, employment, and maximizing economic benefits, high priority should be given to the expansion of middle schools.

Because of the importance of this analysis to the study teams conclusions, team member Professor John Chang conducted an independent but parallel rate-of-return study. His findings are essentially the same as those reported here. Dr. Chang's report is included as Appendix B.

CHAPTER FOUR

PROPOSED CHANGES IN KOREA'S EDUCATIONAL SYSTEMS

The first broad task of the study team was to attempt to determine the effectiveness with which educational resources are being deployed in efforts to achieve the goals the Republic of Korea holds for its educational programs. The second task undertaken by the team was to attempt to predict alternative deployments of resources which would yield greater achievement of existing goals or would permit setting more ambitious national goals. This chapter of the study team report will describe the inferences made by the team of current educational goals in the Republic of Korea, what changes and additions to the national educational goals the team concludes are desirable and possible, and finally, a description of the educational processes products, and changes necessary to maximize the return on national investment in education.

Procedures used in examining educational goals

The focus of the study team's early work was an attempt to abstract from many different sources the goals and objectives of the public educational system. The mission assigned by the Korean Government limited the analyses to those schools below the college and university levels. As the study got underway, the team tended to concentrate more, for reasons to be brought out later, on the elementary and middle schools and on the various pre-college vocational programs. No nation has worked out a set of operational definitions of its educational goals for the several levels of schools comprising its educational system. In some respects, it could be said that nations have operationally defined their educational goals in terms of headcount; that is, how many students are permitted to enter the system, how many are in attendance in a year at the different levels, and what number are allowed to pass prescribed checkpoints and proceed to the next level of education. As with most other countries, the schools and the Educational Ministry of Korea can readily and accurately provide this kind of information. For the measurement of educational goal achievement, this would be analogous to assessing the production and success of a corporation by counting the employees. Headcounting provides useful but grossly insufficient information for assessing goals set or the attainment of those goals.

As the need to apply the systems approach and the concept of accountability to educational programs becomes recognized,the necessity of developing, insofar as possible, statements of intended educational outcomes becomes apparent. Time and resources did not permit the study team to derive precise descriptions of the outcomes of the contemporary Korean educational programs. The team was, however, able to infer from its work certain intentions for education in Korea and certain results--the two not always being the same.

In trying to target the educational goals, the study team went to many information sources. These have been described in some detail in Chapter Two of this report. The team, as individuals or as a group, visited schools at all levels in each province. They talked to students, teachers, administrators, and provincial board members, and in-depth interviews were held with senior officers in several of the Ministries as well as university educators and researchers. They also examined instructional materials, texts, syllabi and training aids. They began with a careful review of the National Educational Charter issued by President Park and other available goal statements. By examining goal statements and listening to national educational leaders, they were able to form impressions about the general intentions for Korean education. By observing the actual classroom instruction, examining instructional materials and tests, both teacher developed and national, the team arrived at tentative hypotheses about outcomes actually being served by the schools.

Contemporary educational goals

Learning outcomes in the elementary and middle schools seemed to fall almost exclusively into the informational and skill categories of educational objectives. The students do appear to be acquiring the skills of reading, writing and computation, though with variable proficiency. The team was astonished at the information storage and retrieval capacities of the Korean youngsters, though the relevance of much of what was stored by the students was not apparent. In the attitudinal domain, "anti-Communism" is a specified block of the instructional program and "badness" of Communism, particularly the North Korean variety, is stressed. The most salient feature of the learning experience of the Korean students observed by the team can be characterized as rote memorization of classically academic material. The overriding objective being served by these learning experiences is that of preparing the student to compete on the national examinations which are used to select those students who will be allowed to enter the next level of education. In the past, there have been three such competitive examinations and the number of students eliminated from continuing academic progression by these exams has been sufficient to make them major determinants of instructional practice. The examination for entry into the middle school has been eliminated recently as a criterion source for selection, and it is too early to tell if its elimination will have a rationalizing effect on the elementary curriculum. The study team is not optimistic that doing away with the examination, in itself commendable, will be a sufficient impetus for meaningful curriculum change at the elementary level. The examinations are still in use for high school and college entrance.

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Weaknesses in Contemporary Educational Objectives

Korean educators need to reexamine the educational objectives being served by the elementary and middle school curriculum in order to better align them with the national goals. Several senior Korean educators interviewed by the FSU team recognized the deficiencies of the Korean schools in providing inquiry and problem-solving experiences for the learners.

Moreover, there is a growing trend among those nations having more advanced educational programs to acknowledge the importance and value of "process" and "affective" objectives as well as "information" and "skill" objectives. Considering the growing rapidity with which information becomes obsolete and skills become outdated, there is a clear need to provide an educational experience which will facilitate a person's continuing to learn after he leaves formal education. The processes of analysis, critical thinking, rational inquiry and effective problem-solving are probably better educational objectives for the long range preparation of children for adaptive and rewarding adult behavior than fact and information storage, per se. These process objectives are definable and can be taught to youngsters. Furthermore, they can serve him long after he has forgotten how to extract the square root of a number or the name of the capital of the Congo. The existing mode of Korean instruction, with its emphasis on rote learning, does not lend itself to teaching process objectives.

A mistake made by some educational developers is to act as if one had to choose between information and skill objectives on the one hand and process and attitudinal objectives on the other hand. The decision is not "either/or " but how one can achieve an effective balance between these four types of objectives.

In planning the goals, objectives, and curriculum for the segments of the educational sequence, most nations, Korea included, appear to have failed to address an important set of questions. How much (or how many years) education can this country afford to provide for all of its citizens? Whatever number of years that is, it sets the time limits during which all of the citizenry must be prepared for adult life. The fact that some students will go on to higher levels of education should not divert attention from the reality that most students will not go on, and the formal preparation these latter experience is all they will ever get. The adult will have to play many roles in his life--husband, father, voter, employee, neighbor, and so on. A second crucial question for the national educational planner, recognizing that most people of the Korean nation will only receive six (or perhaps nine) years of formal education, is whether that time is being used to the maximum effectiveness in preparing a person for adult life.

In Korea the level of education to which virtually all of the young citizens are exposed is the first six years of elementary school. It is the ambition of the Korean government to expand free and compulsory education to include the middle schools or extend the level of education to which all children are exposed through nine years. In neither case is the existing curriculum as relevant to adult preparation as the study team believes that it should and could be. On the contrary, the first years of Korean public education are characterized by "college-preparation" even though only a fraction of the younsters will even enter college. It should be noted that Korea is no better nor worse than most other nations in this respect.

Manpower and Economic Considerations in Educational Goal Setting

In the preceding chapter a number of important points were made about Korea's economy and manpower needs that have relevance for the educational planner. The Korean economy has been, and is predicted to be into the foreseeable future, dynamic, growing and responsive to world markets. The mix of its industry is shifting rapidly from an agrarian economy to a manufacturing, technical and service economy. The kinds of manpower with low technical skills, which have supported economic development to date, will be needed in relatively diminishing numbers as the growing sophistication of industry creates an increasing requirement for technically apt personnel.

The FSU study team contends that conventional manpower analysis and needs projection will have only general value for the elementary and middle school planners. Knowing the specific jobs which need to be filled one or two years hence is of use to job training programs which are post-middle school. It is not of much use for middle or elementary school planning because of the significant time gap between the start-up of the job training program and the job placement. This would be less true for projections of higher-level or professional manpower, such as engineers, scientists and managers, where the needs are more stable and thus more predictable.

Furthermore, even in a relatively stable economy--one growing at a slower rate such as the United States, it is known that the average worker will make a marked occupational change at least four or five times during his work career. The specific job skills requisite for his first job often have little or marginal relevance to his subsequent employment opportunities.

All of this is not to imply that economic and manpower studies are of no use to the Korean educator. Indeed, some very useful information for the educational planner has been derived. The economy will continue to grow; it will need more technical, manufacturing and service employees, and the specific job requirements will be continually changing. This suggests that an educational program at the elementary-middle school level should not concern itself with specific job training but treat occupational preparation from a broader point of view. In addition to the basics of education, the curriculum, in order to be more relevant to adult needs, should provide an orientation to the world of work and the workings of the economy as these need to be understood by the average Korean citizen. More important, those basic concepts and principles which underlie a range of different occupations ought to be identified and built into the student's learning experiences in order to facilitate his trainability and retrainability when he, in fact, enters the job market. In addition, the elementary and middle school curriculum should include certain pre-occupational training for all the students.

Some specific job training measures to follow the middle school program which represent alternatives to current Korean practice are described in Chapter 5.

The FSU study team has not presumed to evaluate specific content or objectives of the Korean educational program. This is the business of Korean educators. The team has attempted to identify general areas which, in its judgment, are insufficiently served by the contemporary educational system. If Korean educational leaders agree with those judgments, the Koreans next task becomes the appropriate development of specific educational objectives to remedy the deficiencies.

Instructional Content and the Definition of Objectives Content of Instruction

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both

A fundamental basis for the identification of the content of instruction must be the results of a forecast of manpower needs, since this should reflect a major emphasis of an educational system in a developing nation. Attention must also be paid, however, to other broad goals which are likely to increase in importance as the nation advances.

Most scholars of education as a social system have agreed in assigning it three broad aims, which may be stated as follows: (1) providing the individual with the competence he needs to pursue a satisfying life-time occupation; (2) establishing the social interactive skills, values and attitudes which comprise "good citizenship;" and (3) making possible progressive individual development in enjoyment of esthetic pursuits. Stated in terms as broad as these, it would appear that these aims need to be pursued in any and every country. They embody needs which are applicable to all human beings, wherever they live.

The implications of these general educational goals are mainly in the direction of insuring that the content of instruction achieves a balance. One wants the educational system to produce not simply auto repairmen (for example) but auto repairmen who are proud of their jobs, thoughtful of their families and friends, and able to seek pleasure from life in several different ways, each of which deepens their development as human beings.

Occupational. The forecast of manpower needs will have revealed a set of occupations for which educational needs exist. Occupations can be further analyzed to reveal classes of jobs, and it is with these entities that one can begin the derivation of the content of instruction. Some of these jobs may match similar ones in the United States, at least closely enough so that similar inferences of required skills and knowledges can be made. There are many different sources of job information which can be called upon at this stage to derive the knowledge and skill components of jobs: government agencies at all levels from federal to local have produced a variety of job descriptions containing essential information.

In all likelihood, a particular developing nation will have a need to establish certain kinds of jobs which do not exist in the United States, requiring unique combinations of skills to fit particular economic requirements. A well-developed technology exists for the forecasting of selection and training requirements, the elements of which were developed by Miller and others in connection with the projection of new Air Force jobs in aircraft and missile systems. The procedures available are not confined to military operations but may be applied with equal facility to jobs needed throughout an economy. The outcome of these forecasting procedures is a set of statements representing the objectives of vocational education in particular areas. They may then, in addition, be related to the objectives developed from other job analyses to reveal those skills held in common, in other words, the basic skills.

There is, however, little mystery about basic skills since their general nature has been known for a great many years. It appears doubtful that systematic instruction can be designed without them. They are skills of using oral and printed language, skills of dealing with the physical environment spatially and temporally, and skills of mathematical reasoning and computation. Any advancing society can be expected to require increasing use of such skills at all economic levels and within the widest variety of occupations.

Citizenship. Something comparable to a manpower needs analysis must presumably be conducted in order to provide a basis for the derivation of the intellectual skills, attitudes and values required to establish and maintain societal unity and a loyal citizenry. Such values can be identified (and forecast, to the extent needed) by the application of methods of study familiar to the anthropologist. Having been identified, they can become recognized objectives of an instructional program. Naturally, one should not expect these values to correspond in all respects with those of United States citizens. In the broad area of human rights, however, it is well known that considerable agreement exists throughout the world.

As for the intellectual competencies required of citizens, these cover a range of capabilities from casual two-person interactions, to family member interactions, to participation in larger social groups of the community, state and nation. In many countries, conflicts in these interactive skills may be expected to arise from differences in tribal and evolving national customs. Anthropological methods may be expected to reveal the basic nature and scope of social activities from which needed skills can be predicted.

Esthetic appreciations. Systematic knowledge needs to be gathered regarding the various kinds of artistic production prevalent in the developing nation, as well as the amount and kind of participation by the general population in the enjoyment of esthetic pursuits. Briefly stated, the need is to identify the activities that are fun. With some possible tempering in the direction of providing for expected developments in national preferences, these varied activities can form the bases for a derivation of needed skills. For example, the intellectual components of the art of the dance could be reflected in projected instructional content; or, the skills prerequisite to creating a written literature.

Balance of instructional content. Information concerning the three major educational goals will accordingly constitute a basis for derivation of instructional objectives and will make possible the planning of a suitable balance in the content of instruction. Objectives pertaining to the occupational goal will probably be given emphasis compatible with the social aim of economic development. While many of these objectives may be specific to occupational areas, the identification of need for more general basic skills (pertaining to language usage, mathematics, etc.) may be expected. Content balance will also require appropriate consideration of objectives relevant to citizenship and esthetic enjoyment.

Defining Objectives

Once identified, objectives of instruction need to be defined in terms that are unambiguous and reliable. Methods for accomplishing this task are readily available and have been described by a number of investigators, including Mager (1962), Gagné (1964, 1970), and others. Essentially, the definition of an instructional objective includes: (1) the conditions under which the to-be-learned performance will occur, (2) an action word, and (3) the object or person acted upon. Preferably, the action word should identify the kind of intellectual processing required in the performance, illustrated, for example, by the difference between "recalls" (information) and "solves" (a problem).

Carefully defined objectives have a number of properties essential to the further design of instruction and of an instructional system. In particular, they provide information concerning the type of learning to be undertaken. They also make possible the design of the tasks to be used in assessing the outcomes of learning. In the latter function, they become definitions of classes of performance to be assessed by means of criterion-referenced items and tests. In the former, they serve as the instructional tasks representing convenient components of a course of study, to be analyzed in the manner described by Gagné (1970) for revealing a sequence of skill attainment which are prerequisite to the learning implied by objectives.

It may be assumed that the list of instructional objectives so derived may be divided into sets containing related objectives. Such sets will constitute "courses of study." Some will doubtless resemble those which are familiar and single-discipline-oriented, while others are likely to be quite different from the traditional disciplines. It is not possible to predict the nature of these sets of objectives, since they will have been derived from studies of manpower and other needs, and this method has not been used in deriving what are now traditional subjects and disciplines. Thus, many of the "courses of study" may be novel ones, incorporating objectives which are themselves newly defined, or which occur in new settings.

Current Patterns of Resource Allocations

In order to develop a nation of people all of whom have been prepared for a life of fulfillment in terms of general occupational and citizenship education, the study team feels that a nine-year free and compulsory educational program is required. The expansion of free and compulsory education to include the middle school is an ambition held by most Korean educators and is projected by the Ministry of Education and the Commission for Long-Range Educational Planning. It is generally held by Korean educators that more years of education for more Korean children is a good and desirable thing. It should be noted, however, that simple expansion of the present educational program will not serve the social and economic development needs of Korea unless the schools can provide a higher quality learning experience and one more relevant to adult needs than is presently possible. In order to meet the important educational goals described in the preceding sections, the Korean schools would have to have smaller class sizes, better prepared professional staffs, additional equipment, and a much richer range of instructional resources than is presently available. All of these things add to the cost of education.

In 1969 there were approximately 6.7 million children in the elementary and middle schools. There were an additional million children in the eligible age range (6- 14 years) who were not in school, most of these being children who were not permitted or who could not afford to go beyond the sixth year of schooling. At the currently projected population growth, there will be 8.2 million Korean children in the age range six-to-14-years or a net increase over 1969 of 1.5 million children eligible for elementary or middle school enrollment. At the present per student annual expenditure, it would cost roughly 126 billion Won per year to accommodate these children in school. It would also require, at the present ratio of 66 students per classroom, 15,650 new classrooms at a total cost of 21 billion Won in construction costs. If the student/classroom ratio were reduced to fifty-to-one, it would require 55,294 new classrooms at a total cost of over 78 billion Won.

None of these cost estimates make any provision for improving nor making more relevant the educational program. Even the most optimistic projections of increase in GNP, national budgets, and education budgets over the next five years will not permit expansion of the present system to a sufficient degree to accommodate all the age-eligible children in nine years of free education.

The task of the study team was to determine whether or not an educational program could be designed which would, simultaneously, improve the quality and relevance of Korean public education and make that education available to all children.

The Fallacy of Free Education in Korea

The practice of free public education as it is understood in the United States is virtually non-existent in Korea, even in the elementary schools which are purported to be free. All parents, except in defined poverty families of which there are relatively few, must contribute to the PTA fund of the local schools. This contribution is on a sliding scale related to family income. The PTA fund must be regarded as part of the real operational budget of the school. It may be spent under prescribed conditions for school construction, instructional materials and as a supplement to teacher salaries. These are not options added on but are an essential part of the operating funds upon which the schools rely.

Also, Korean school children buy their own textbooks, materials and supplies. A consequence of this is that Korean schools do not derive the cost advantage attendant with year-to-year reuse of textbooks whose cost is amortized over several users.

Table 4-1 shows an estimate of the total public educational expenditure in 1969, and the portions contributed by the government and the family. Of the nearly 70 billion Won spent in 1969 for the elementary and middle school programs, 24.7 billion came from the family. Through some cost reduction and shifting the financing of the schools to the national budget, it is predicted that the Korean family can be totally relieved of this expenditure in the future.

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In addition to the expenditures shown in Table 4-1, Korean families spent a total of 6.6 billion Won on tuition for those elementary/middle school students enrolled in private schools. Also spent by families was a total of 10.5 billion Won for outside tutoring and studies. This extra, out-of-school tutoring and study is paid for by the families to give their children a better competitive edge on the national examinations. Had this total of 17.1 billion Won been distributed evenly across the 6.7 children in the age group, it would have added an average of 2,552 Won per child per year.

$8.17

In other words, the real per-student-per-year cost of education for children in Korean elementary and middle schools in 1969 was 12,878 Won. The real total educational cost during this period was 87 billion Won of which barely more than half came from tax sources. Of course, the private family contribution comprises an indirect form of taxation. and eliminating it would make it direct through additional forms of taxation

41.25

If public schools through the ninth year were open to all students, were free, and were of uniformly high quality, it is reasonable to assume that the need for private schools and out-of-school tutoring and study would be markedly diminished. It is probably also reasonable

Table 4-1.

Public School Expense--Elementary and Middle School: 1969

Source	Amount	Per Student	
Tax Contribution	₩ 45, 141, 300, 000.	6,667	$ 21.36
Family Contribution			
PTA	₩ 7, 207, 900, 000.	1,065	3.41
Text & Materials	₩ 17, 560, 702, 912.	2,594	8.31
TOTAL:	₩ 69, 909, 902, 912.	₩ 10,326	33.08 8.17 41.25

to expect that the funds used for private schools and tutoring could, in large measure, be diverted to public school support, though in the form of public school taxation. ah ha

Targets for Future Educational Development Expenditures

After studying the several parts of the Korean educational program, the study team is prepared to make some recommendations with respect to expansion and development priorities. In view of the expected growth of the Korean economy, particularly in manufacturing and technological industry, there is no doubt that the nation will need more engineers, scientists and managers than its universities are now producing. These manpower projections are well documented by the Ministry of Science and Technology. However, it can be argued that the total number of college graduates being produced are sufficient for the nation's needs, and what is needed is a rearrangement of enrollment quotas by area within the universities rather than increases in the total enrollments. If one agrees that the overall production of college graduates is sufficient, then it follows that the feeder schools, the academic high schools, are also of adequate size. Reports were received that suggest the curriculum of the academic high school was neither as modern nor as rigorous as it might be to best prepare students for university work. Both of these problems should be locally remedial without drastic intervention or increases in enrollments.

The vocational high schools of Korea, which enroll something over half of all the students who stay in school beyond the ninth grade, do not seem to be effectively serving the purpose for which they were formed. They do not appear to be preparing students for either occupational entry or college enrollment. The academic portion of the vocational high school curriculum appears to be a diluted version of the college preparatory curriculum found in the academic high schools and has little relevance to occupational preparations. Also, the vocational part of the curriculum appears to be equally ineffectual, only a small number of vocational high school graduates ever find employment in the occupational area for which they havebeen trained. For these and other reasons the study team concluded that the vocational high school programs, as they now operate, are neither effectual nor economical. A more complete description of the occupational training programs and attendant recommendations are given in Chapter Five.

Limited financial and professional resources, as well as the press of time, point up the need for Korea to target its educational priorities rather than diffuse resources across the entire educational program. This latter course of action, most often taken by nations, generally fails to generate any significant improvement at any of the educational levels. The resources which could make a difference if concentrated on the area of greatest need are too thin to have any effect when spread over the entire program. In the case of Korea, the study team recommends that the university and academic high school programs be maintained at their present rate of growth and improvement measures be taken in the future--an evolutionary improvement through time such as might be ordinarily expected in the normal course of events. The study team recommends a change in the purpose, duration and curriculum of the vocational preparation pro-

Mr. Chae [illegible] to [illegible] [illegible] in [illegible] [illegible] [illegible] and sch grams which are described later in greater detail.

The highest priority for extraordinary change and development investments for Korea for the next five years should be the elementary-middle school program. It is believed that Korea can, through a substantial but feasible investment in the development and empirical validation of a significantly differend kind of elementary-middle school, provide a demonstrably higher quality educational program for all age-eligible Korean youngsters than otherwise would ever be possible. Further, it is predicted that this program, once developed and installed in the nation's schools, would not only be cost effective but also, in fact, cost less per child per year than is presently expended in Korea. In fact, the projected reduction in the unit cost of operation, if obtained, would make it possible to accommodate the 8.2 million children of 1975 at a total cost that will not exceed the portion of the forecasted educational budget currently allocable to the elementary and middle schools.

Characteristics of Proposed Elementary-Middle School System

The balance of this chapter is devoted to a description of the characteristics of a proposed elementary-middle school which the study team believes would be more effective and efficient that the presently operating system in Korea. The next chapter will deal with the steps necessary for the development of such a system. It is believed that Korea already possesses the technical capability to develop and install the system being proposed.

The FSU study team has already acknowledged its indebtedness to the group of consultants to Korea sponsored by the Midwest

Universities Consortium for International Activities. The reports of Brian W. Carss, Harry Broudy and C. G. Screven were particularly valuable in contribution to the conceptualization of a new and alternative elementary-middle school system. A salient characteristic of the proposed system is the appropriate utilization of educational technology. Dr. Screven's definition of educational technology is consistent with the views of the study team and is sufficiently encompassing to serve the purposes of this report. In Dr. Screven's paper, "Educational Technology: A Plan for Implementation in Korea," the following definition is given:

> ". . . educational technology refers to the application of not only communication technologies, but also the technologies of behavioral analysis, responsive test systems, and teaching-learning systems developed in relation to measurable learner performance. Educational technology is a systematic effort to arrange the instructional process so that the various human and nonhuman methods for instruction are developed and improved to facilitate specific learning outcomes." (Screven, 1970)

There are three major areas of difference between the proposed system and the current system. The new system will employ a different method of grouping students and organizing the school. The range and mix of instructional resources will be different, including the ways in which the professional staff will be utilized. Third, the instructional patterns will be different. A fourth recommendation will be to combine the elementary and middle schools into a single organizational unit. While the study team feels this last change would contribute to an increase in the effectiveness of the schools, a decision not to combine the two levels would not significantly diminish the effect of the other changes.

Student Grouping and School Organization. At the present time the average enrollment of the elementary and middle schools of Korea is approximately 900 students. In the elementary schools this is divided into six levels or grades by student age; the middle school is divided into three grades on the same basis. Instead of dividing the students into n groups of 50 to 60 children by age level, it is proposed to divide the students into instructional units of 300 students, so the average school would have three such units. In larger or smaller schools, the students enrolled would be organized for instructional purposes into multiples of 300 or as near as that number can be approximated. Because of the individualized, automated and small group instruction anticipated these students might be grouped in terms of the similarity of their attainment of the educational objectives, independent of their chronological age levels. It should be noted that the variance of achievement of students within a class is usually greater than the variance between classes. Put another way, in the typical fourth year class there will be some students who are more advanced in their achievement than many fifth graders, some sixth graders and a few seventh graders. The same overlap with the third and second grades will be found with the slowest fourth graders. (See Figure 4-1.)

In order to maximize the flexibility of use of physical facilities and instructional resources, it will be possible to comprise the instructional unit of 300 highly variable students in terms of age and achievement. The entire 300 might all be first graders in a large school; be a mixture of first, second and third graders in a smaller school; or be made up of first through ninth graders in

Seems contradictory must check experimental evidence they've obtained
or additional testing evidence of the grade attainment-age independence hypothesis

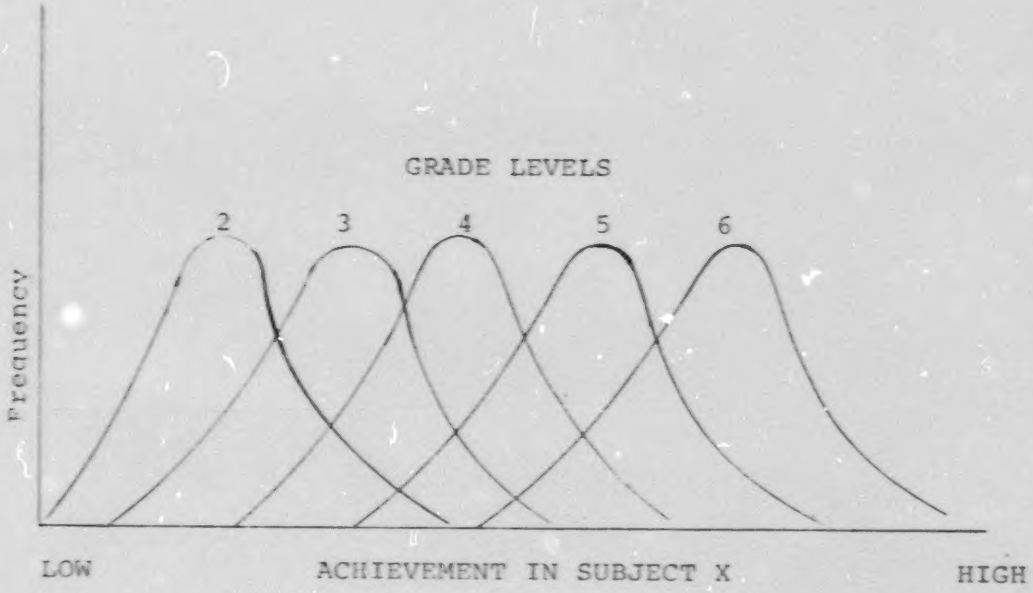


Figure 4-1. Hypothetical distribution of the achievement scores in a given subject made by students in different grades.

a small rural school.

An instructional unit will become the responsibility of a four-person teaching team whose functions will be differentiated and carefully defined in terms of what each team member contributes to the learning experience of the students. It can be readily seen that this will raise the student/teacher ratio from the present 55-to-1 to 75-to-1. Ideally, the instructional unit would have access to small rooms for small group projects and instruction; large open work space in which the students could spread out for self-study; and a large room for group reception of radio and television instruction. An unfortunate constraint, to which no alternative could be found, is the configuration of the 108,000 existing Korean classrooms. These classrooms are of a relatively constant size (probably adequate for forty students) and cannot be expanded because their walls are generally load bearing. A paper by Charles H. Sederberg of the MUCIA group describes the rather desperate situation regarding educational facilities in Korea (Sederberg, 1970). It was concluded by the study team that a new elementary-middle school program could not be contingent upon much new school construction nor even much physical modification of existing schools. The schools that now exist will have to be used almost as they are for many years to come. New school construction that would normally occur should be designed to optimally accommodate the new curriculum. The type of curriculum, as will be seen, incorporates individualized and self-directed study, teacher-directed group work, and radio and television instruction, in roughly equal proportions. A planning problem was fitting these simultaneous but different modes of instruction into the conventional Korean classroom arrangement, and at the same time maintaining economy of space utilization.

It is proposed that the instructional unit (with 300 students and four staff members) will have six conventional classrooms permanently assigned to it. This would make an average student to classroom ratio of 50-to-1, down from the present 66-to-1. Roughly a third of the students' instruction will be provided by programmed television and one of the six classrooms will be equipped for this purpose. With a third of the students in the television room at any given time on a rotational basis, the other five rooms will be available for the instruction of the remaining 200 children in the instructional unit. This means the self and teacher directed portions of the learning experience will occur with an average of forty students per room--yielding groups of manageable sizes.

In order to get the learning group into sufficient space, the Korean government must face a socially and politically difficult decision. Sederberg in his report described the apparent need to move the Korean schools to a double-shift basis, and the study team was unable to find any viable alternative to that action. The fact that students learn and that teachers can teach in today's miserably overcrowded Korean classrooms is a credit to highly motivated and determined teachers and long suffering students. Or it may be that, in fact, not much is learned. A school may not suffer from having fewer teachers, but a student must have at least enough room to place the materials on which he is working in front of him. The organization of students in learning space recommended here by the study team is far from ideal and may be regarded as an absolute minimum if improved education is to be possible. While it is financially out of the question for the Korean government to build enough schools in the near future in order to avoid the need for double shifts, if the present rate of construction is maintained or only slightly increased, the schools probably could be reverted to single shifts in about ten years.

Check for [illegible]

Because of the self-study nature of much of the planned educational materials, the students will be able to do more learning in their homes or out-of-school. It should be possible to shorten the time in school for the students by at least an hour a day without reducing real instructional time or learning achievement.

The Instructional Resources. For all intents and purposes, the curriculum of the Korean school is almost exclusively determined by the textbooks and course syllabi approved by the Ministry of Education. Most of the textbooks are developed under the direction of the Ministry of Education. Of all the potential teaching resources that might be employed, the Korean school is basically limited to only two resources: the teacher and the textbook. As L. J. Peterson has pointed out, the Korean educational system is a labor intensive enterprise from an economic point of view (Peterson, 1965). Harry Broudy has recommended a careful review of the possibility of using alternative and additional instructional resources, particularly those with development built upon the concept of programmed instruction (Broudy, 1969).

Even if teaching personnel did not use such a large percentage of the educational budget, there is a more compelling reason for reducing reliance on the teacher in the learning process. Like other human abilities, teaching competence and knowledge of the subject taught will vary greatly from one teacher to another. The variance in teaching effectiveness will penalize or benefit a student,depending on which teacher he draws in a course assignment. Fortunately, chance distribution can preclude a student getting all bad teachers. By the same token the odds are rather low that he'll get all good teachers. Furthermore, even in the case of good teachers, it has been demonstrated that some of the things taught by the live teacher can be taught as well or better using less costly instructional resources. It has also been observed that teachers, in the course of their days work, do a great many things such as paper grading, record keeping, study monitoring, etc., that could be done as well by a person with much lower professional qualifications.

The study team approached this problem from the point of view of trying to identify the broadest possible range of instructional resources which had potential use, without feeling bound by the traditional manner in which teachers and textbooks were customarily employed. Practices and techniques which were innovative in the sense that they were not in widespread conventional use were carefully reviewed to see if they might contribute to Korean instruction. There are many such innovations and technologies,including programmed instruction, reinforcement contingency management, team teaching, criterion-referenced testing, computer assisted instruction and so on. Many of these were discarded early in the analysis as being inappropriate, too expensive,or technically infeasible.

For example, the enhancement of student motivation to learn in school is of major concern in many countries and Homme's work with reinforcement contingency management may have much relevance in these situations (Homme and Tosti, 1965). In Korea, however, student motivation, for the present at least, is not a problem--students from all socio-economic backgrounds appear highly motivated to perform well in school. Computer applications to instructional improvement was rejected as a possible resource because it is not cost competitive and is technically too cumbersome for use in Korea in the near future.

Two general innovations with their attendant by-products and supportive elements do appear to have potential value for Korean education. These are (a) the instructional design concepts associated with the development of programmed instruction and (b) a differentiated and flexible utilization of staff.

Programmed Instruction. Programmed instruction (PI) grew out of the work of Sidney Pressey and B. F. Skinner and captured much attention in world education in the early and middle sixties. It has the added advantage of being fairly well known as a concept to Korean educators. In its earliest form PI was a rather mechanistic approach to providing instruction. The early programs were printed words or symbols presented in book form or by means of unsophisticated teaching machines. The programs usually consisted of providing instructional content in small steps, requiring an active response from the student based on the instruction and then confirming the adequacy of the student's response. These three elements (stimulus, response and confirmation) were generally called a frame, and a sequence of frames made up a program of instruction. Programs were developed of variable length from a few dozen frames teaching only a single concept or part of a course to programs having thousands of frames teaching whole sequences of courses. These programs were able to employ certain important principles of learning which usually cannot be accommodated in conventional group instruction. Both employing and failing to employ these principles have been shown to have a significant effect on rate of learning, final achievement and retention. In PI the material is empirically developed so that students for which it was designed can proceed through the step-by-step instruction with a low incidence of error. Successful progress is rewarding to the student, and reward or reinforcement has been shown to be crucial to learning. Also, the student is an active participant in the learning process, as contrasted with the passive listener in most conventional instruction. In PI when the student stops actively responding,the instruction also stops. Since the students response adequacy is being continuously evaluated in the program,he is receiving immediate and continuous feedback on his progress. The programs were also thought to be less intimidating to the student than a live teacher because the students interaction with the program was generally a private experience. The programs also permitted the student to progress at his own rate.

But most important was a philosophy and set of assumptions surrounding the development of the programs. It was assumed that if a student who possessed the specified entry qualifications did not learn from the program, then the instruction not the student was at fault. Programs were therefore revised based on try-out feedback from real learners until they took the student to the defined objectives with predictable regularity.

While programs of instruction are in use in the majority of American schools today,they are not used to teach a very significant portion of the curriculum. They are usually used as adjunctive instruction,providing remedial or supplementary enrichment materials. One of the main reasons PI is not in more general use in the United States is that it has been regarded as additive rather than substitive instruction, and if the cost of PI is added to the already high costs of personnel, instructional materials and other resources, then it must be regarded as something of an educational luxury. By its nature PI can be developed which takes the place of certain other forms of instruction.

The most important impact of the effort surrounding PI this past decade is not the program itself. It is the idea that learning experiences can be programmed, using a variety of formats, media and instructional settings in such a way as to significantly and predictably enhance teaching effectiveness. The by-products of PI, more important than PI per se, include the techniques of operationally defining educational objectives in behavioral terms, the individualization of instruction, mastery learning, programmed multi-media instruction and educational accountability. The need and techniques for developing behavioral objectives was discussed earlier in this chapter.

Programmed Multi-Media Instruction

Work by Leslie J. Briggs of Florida State University and David Markle of the American Institutes for Research suggests that the

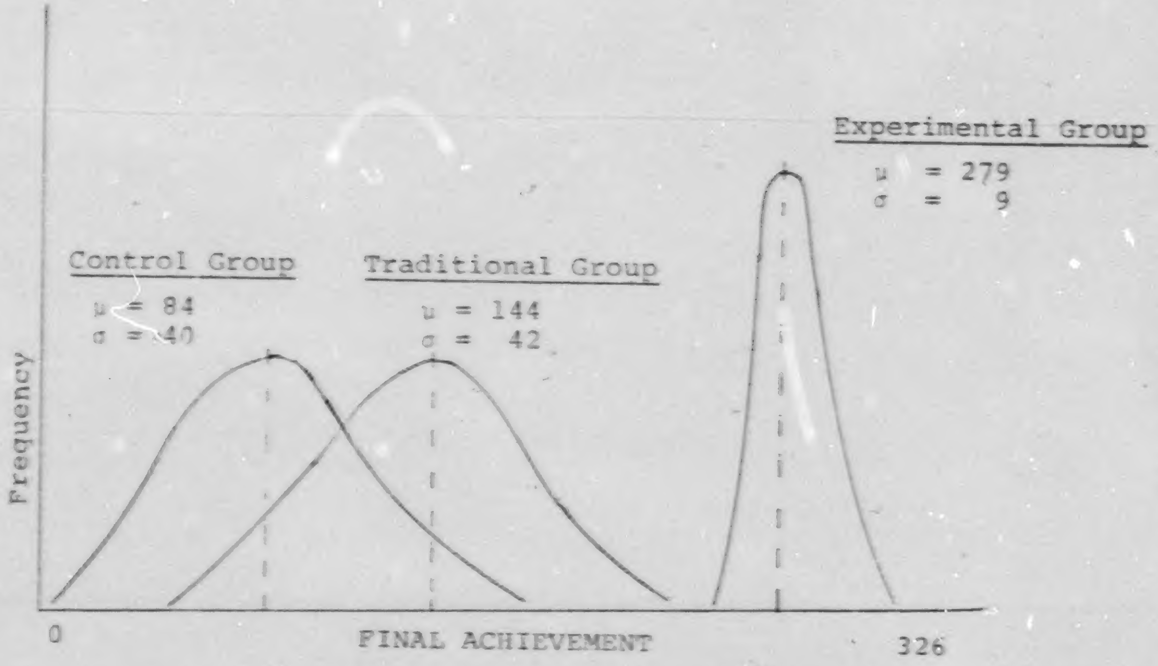
Invalid comparison

potential instructional power of the programmed multi-media approach is great (Markle, 1967). (See Figure 4-2.) In the imperical development of an instructional system for an industrial course built for American Telephone and Telegraph Company, they were able to reduce the time to completion by 25 percent and to increase the average final test score from 145 for the traditionally taught group to 270 for the experimental group. The standard deviation was reduced from 42 to nine, and the worst performer of the experimental group scored 44 more points than the best performer of the traditionally taught group. This study employed a mix of tailored media which underwent three revisions based on learner data. This development project effectively demonstrates what can be achieved through carefully and empirically engineered instructional materials.

The use of programmed audiovisual media is not unknown in Korea; indeed, the work of Professor Ki Hyung Oh is most impressive, though he has not had sufficient financial support to develop programs as intricate as the Briggs and Markle model.

Individualized Instruction

Individualized instruction, an outgrowth of the programmed instruction experience, is perhaps the most promising development in instructional technology at the present time. It is promising because there is evidence that such approaches can be developed and operated without complex equipment and without additional operating expense. There are several programs of individualized instruction in Europe and in the United States that are in operation and continuing development today. The two that have been underway the longest and are the



μ - Mean
σ - Standard Deviation

Figure 4-2. A comparison of final achievement of students taught with the Briggs-Markle instructional system, a traditionally taught group, and a control group which received no instruction.

Excellent progress in
reading and math'
for comparison
with ROK
[illegible]
[illegible]
[illegible]
[illegible]

best known in the United States are the Nova High School program in Broward County, Florida and the Oakleaf Elementary School program in Pittsburgh, Pennsylvania. Both are being evaluated as development continues.

Jack Edling (1970) has recently reviewed a number of individualized programs throughout the United States. Two projects with which the study team is familiar are underway in the Duluth, Minnesota public schools (Esbonsen, 1968) and the Bloomfield Hills, Michigan schools. L. V. Rasmussen of the Florida State University (formerly Superintendent of Schools of Duluth) and Eugene Johnson, Superintendent of Schools in Bloomfield Hills were responsible for the direction of these projects. While there are differences between the several projects,they are sufficiently similar for a description of one to suffice. In Bloomfield Hills the entire curriculum for three schools has been individualized. The three schools, an elementary, a junior high and a high school, provide a kindergarten through twelfth grade test environment. Teams of local faculty members in these three schools, working with central district office specialists, and outside consultants, developed specific behavioral objectives for the entire curricular offering. There are terminal performance objectives, the sum of which make up a defined course of study, and interim performance objectives, a sequential group of which lead to a terminal objective. After developing the objectives,the teachers analyzed the instructional materials available in the system and encoded relevant portions of these materials against the objectives. For certain objectives, they judged no material to be suitable and developed their own instructional resources. Their next step was to develop instruments and techniques for determining whether or not a performance objective had been attained by a student at the specified level of proficiency. Finally, the products of these efforts were organized into self-contained "student learning units " which for a given block of instruction told the student what was expected of him in objective terms, what specific instructional resources (including teachers) he might fruitfully employ in achieving these objectives, and finally how he was going to be evaluated on the objectives. The student, working by himself or with other students, could then proceed at his own rate, calling for help or assessment on any given objective whenever he felt he was ready. Indeed,many of the students were able to demonstrate proficiency on some of the terminal objectives at the beginning of the learning sequence, thus avoiding spending learning time on things they already knew.

How much faster? Comforting to control hypotheses

Visiting of any of these programs and talking to the students and teachers are convincing experiences. While the youngsters are moving through the curriculum at variable rates, they are as a group tending to go faster than the traditional pace,and some of the students are moving very rapidly.

These programs have particular relevance for the Korean planning effort because (a) with appropriate materials they will yield a higher quality learning, (b) the students will learn more in less time, (c) a lower reliance and demand will be placed on teacher time and,(d) the student is placed in the position of taking a large measure of responsibility for his own learning. Sweden is reported to be developing and implementing these kinds of programs in its high school system.

An unexpected occurrence observed in all of these programs is the way in which the students informally organize themselves to help one another. It has long been suspected that peer teaching was a potent instructional resource, but conventional group instruction militates against this happening in any systematic way.

very good

Mastery Learning. A program bearing many real similarities to those outlined above is described by Ben Bloom of the University of Chicago in his paper, "Learning for Mastery" (Bloom, 1968). Bloom, as well as Bruner and others, has maintained that given appropriate conditions of learning nearly all students in a given course of studies could achieve course mastery. In conventional instruction, the presentation of content and time for learning is relatively constant and terminal achievement is inevitably highly variable. Educators, steeped in the mystique of the Gaussian normal curve of distribution, have viewed such results as unavoidable. Bloom set out to see if evidence couldn't be found which would support his hypotheses about the feasibility of mastery learning. Taking a University of Chicago course of studies, he carefully analyzed the course content. He arranged the content in objectives form with the objectives in hierarchical sequence in the fashion described by R. M. Gagné in his book Conditions of Learning (Gagné, 1970). Bloom then developed what he refers to as formative and summative evaluation instruments--tests to tell the student how he is progressing in the objectives sequence and how well he has done at the end of the course. Bloom then analyzed relevant and available instructional materials, relating specific teaching units to particular objectives. It can be seen that what he developed is not dissimilar to the "Student Learning Units" of the individualized programs described earlier. Bloom, using a parallel form of the final examination, evaluated two groups of students and found a greater percentage of "A" level students in the group learning by his system than in the groups receiving conventional instruction.

[illegible] formative

Perhaps the most significant educational development project in Korea has built and indeed gone beyond the Bloom "Learning for Mastery" model. Work by Bom Mo Chung, Ho Guion Kim and their associates at Seoul National University and the Korean Institute for Research in the Behavioral Sciences is most promising, both in scope and design. These researchers augmented the Bloom approach by developing programmed instructional units to supplement the otherwise available instructional materials. Their results of the past two years are at least as encouraging as Bloom's findings. While, because of limited financial support, the project of Chung and Kim's is fairly restricted in terms of the subjects and levels being developed, it has led the study team to conclude that an adequate nucleus of a Korean capability for a larger scale effort already exists. When these resources are taken together with the resources of Hyun Ki Paik's Central Educational Research Institute and Professor Oh's capability at Yonsei University, an impressive range of talent is potentially available to produce a significant, long range educational development effort.

The importance of these resources should not be underestimated. For genuine educational reform to be achieved in the elementary and middle schools, reliance must be placed on technically proficient Korean educational researchers. Foreign contractors or consultants could not do the job.

Individualized Instruction in the Korean School

It is reasonable to assume that the Korean government can assemble educators and lay citizens who can undertake the reappraisal of the nation's educational goals for its elementary-middle school program and that these goals can be translated into detailed sequences and hierarchies of educational objectives. The latter will serve as the specifications of learning outcomes for the entire curriculum. Then educational researchers can estimate the most economic and efficient instructional means by which the objectives can be achieved. The study team estimates that one third or more of the objectives can be best reached by using individualized student learning units. These can be prepared in modular and overlapping formats so that the part of the curriculum to be taught in this manner will be fully covered by the units. The student learning units will be packaged in a durable manner to permit their use and re-use for four or five years. Since students will progress through these at different rates and will have different starting points, it will be possible to have many fewer units than students. The appropriate ratio of learning units to students can be determined empirically during the development phase of the project. The student learning units will make it unnecessary for each student to own his own set of textbooks and thus make it possible for each constructional unit to have a miniature reference library. The student learning unit will include: (a) a detailed statement of the enabling and final objectives covered by the unit, (b) pretests, interim progress checks, and final proficiency test on the objectives for

How does the student get material to study at home?

student and teacher use, (c) the basic programmed and other instructional materials to teach the objectives, and (d) directions to other appropriate and readily available instructional resources not packaged in the unit. Th will be developed, tested and revised until they are valid and reliable in teaching the students for whom they are intended. They will be stored in the classroom, readily available to the students and classified and encoded in such a way as to allow easy progress by students through the units. It has been demonstrated that even preschoolers can become very proficient at the necessary storage and retrieval tasks.

Progress reports will be furnished the teaching staff by the students at regular intervals as they work through the units. Depending on the scope of the unit (and this will vary) and the individual speed of the student, passing a given checkpoint could be reported as often as two or three times a day, or once a week, or even less frequently. It will be useful for the teaching staff in monitoring the progress of the group and the individuals of the group to have a "production board" that shows the objectives by course area and level, and uses a card for each student to indicate individual placement. The teacher can then tell from moment to moment: (a) where each student is at any time in his progression through the objectives; (b) how he stands with respect to the other students; (c) when he started a given unit and how long he has been working on it; and (d) what he will need next in the sequence and approximately how soon he will be ready to start it. With this information a teacher can tell which students need special help from him or one of the other students, and when sub-groups within the instructional unit are ready for teacher-directed experiences beyond those included in the student learning unit. These experiences might include a small group project, a science demonstration, group discussions, a lecture, or other special assignments. Indeed, several different activities might be occurring at the same time with the teaching staff organizing and orchestrating the activities as well as serving as resource persons.

Clearly, what is described here is a marked departure from the conventional classroom where all students are being taught the same things at the same time--where many students daily receive instruction in things they already know and the teacher is forced to move on in her presentation before some students fully comprehend what is being taught. In the conventional classroom the teacher behaves, necessarily, much of the time like a tape recorder moving inexorably from one point to the next. The students, on the other hand, are sitting quietly, hopefully listening and taking notes, and occasionally responding to a request to recite or seizing an opportunity to ask a question. The individualized classroom, in contrast, is not very quiet (there are the busy sounds of learning); the students are working on different things and the teacher is a manager of a learning environment and a resource person to be used when and as the student needs help. The teacher becomes, in the individualized system, a true professional and doesn't behave at all like a tape recorder.

In visiting many individualized programs, the members of the study team have been struck by the positive, enthusiastic response of teachers in these programs, though some had indicated trepidation at the onset.

The Teaching Staff in Individualized Instruction

In the conventional classroom the most active person is the teacher--she is talking, writing on the blackboard, asking and answering questions, calling the class roll, grading papers, arranging instructional materials. If one believes John Dewey's precept that one learns best by *doing*, then teachers should be learning at a furious rate. In individualized instruction, the teacher is required to behave in a different way than he has in the past and in ways in which he has not been prepared in teacher training programs. It should not be surprising that teachers experience apprehension when asked to play a role to which they have not previously practiced. A necessary and integral part of an educational reform effort in Korea will be to provide an extensive, inservice staff training program to prepare teachers for the new roles they will need to play. Appropriate teacher performance in an individualized setting is different and there is no reason to assume that traditional teachers can automatically fit into the new programs without training. Pre-packaged, individualized materials to equip teachers with the necessary new skills can be developed which can be used with teachers now in schools and can become part of the pre-service curriculum of the teacher training institutions. Also, television can be used in the schools for teacher preparation.

[illegible]

A development in the United States which is conceptually appealing is differentiated flexible staff utilization. In the opinion of the study team, there are no cases of differentiated staffing which are exemplary or which can serve as models for Korean planning. Yet it seems clear that the mix of learning experiences envisioned for the new school in Korea calls for a professional staff which will have differentiated specialties. The members of the study team, it must be admitted, have not reached full accord on the number of staff needed for the instructional unit of 300 students. Estimates have ranged from three to six and for purposes of this report the number four has been chosen. In the development phase of the project, Korean researchers should test various arrangements to determine the minimum and optimum number of staff needed. The answer to this question, which will need to be arrived at empirically by Korean researchers within the local setting, will depend on the instructional self-sufficiency of the individualized student learning units and the programmed television and what proportion of the objectives can be effectively taught through these instructional modes. Socialization objectives dependent upon group interaction will doubtless require greater staff involvement than information presentation and drill. Probably, reliance on professional staff involvement in student learning will be inversely related to the magnitude of the materials development effort. It is, however, safe to estimate that the members of the teaching team will number no fewer than three and no more than five.

[illegible]

There are several convincing aspects of the idea of differentiated staffing. For this discussion the following points should be cited:

Differentiated Staffing

1. can provide for better match of teacher's training and abilities to the requirements of the new system.
2. recognizes competencies in functional areas and relates them to responsibility and salary,
3. makes possible career patterns in education,
4. makes possible better and more systematic evaluation of personnel performance,
5. can provide an adequate salary range to attract and hold many categories and levels of qualified educational personnel.

The first two points mentioned here are the most important. The general concept of differentiated staffing allows for relatively specific functions to be delineated, required competencies in the functions to be stated, and responsibility for performance to be more carefully matched to the prior training and abilities of the teachers. The general model of education being developed in this chapter changes the emphasis in the teacher's role by decreasing the emphasis on information giving activities, increasing the emphasis on higher order cognitive processes, and increasing the emphasis on careful management of the learning environment. As these new emphases become more clearly understood (in part through techniques discussed in Chapter Seven), it will be possible to allocate responsibilities to various members of a differentiated team which will be able to accomplish more in the classroom through coordinated effort.

As currently conceived, and subject to verification by Korean researchers, each teaching team would consist of a master teacher, an experienced associate teacher, and two or more teaching assistants. Each member of the group would be trained to perform relatively specific functions and detailed professional job descriptions will need to be developed based on an analysis of personnel functions in the new Korean school programs. As an example of how such a group might be organized, the following descriptions are offered:

1. Head Teacher--leader of group with responsibility for planning activities, direction of team member performances, supervision of all members of the unit, etc. Could possibly be responsible for all group lectures, review of student performance, formative evaluation of the teaching unit's progress. Would require a competent leader with organizational ability. Salary should be high enough to attract and hold such a person.

2. Experienced Associate Teacher -responsible for student diagnosis and prescription and some environmental control activities. Could share some group instruction responsibilities and would be responsible for student motivation. Salary would be commensurate with compensation of an advanced teacher in current system.

3. Instructional Aides--with appropriate training would be responsible for instructional monitoring activities such as monitoring ETV and self-instruction classrooms, maintaining general records, coordinating student movement, etc. Salary requirements would have to be established on an empirical basis.

The interactions of such teams must be developed, as must rather clear analysis of their performance requirements. The patterns of differentiation must optimally allow for a career ladder to be available, for differentiated training to be available and for relatively specific staff evaluation. To achieve a clearer understanding of the potentialities of the differentiated staffing concept, it would be necessary to analyze the objectives of the new model; analyze the functions; tasks and activities to be performed in the classrooms; generate a listing of specific skills and knowledges needed to perform the various tasks and functions; establish performance standards and criteria; and develop new teacher curricular programs as indicated.

The primary points to stress in this discussion of potential changes in staffing patterns in Korean schools are: (a) that the new system being suggested here will require new behaviors of the teachers in the classrooms, and concomittantly new training both at the pre-service and inservice levels, (b) that there are logical and valuable methods or techniques which may be used by Korean researchers to ascertain what the new teacher behaviors should be and how they might best be organized, and (c) that the results of these changes in the traditional role of the teacher will be to increase the efficiency of these personnel, thereby increasing the overall effectiveness of the educational system within a context which will be professionally rewarding to teaching personnel.

The Use of Radio and Television in the New Korean School

The study team proposes that a national educational radio and television distribution system be developed which will continuously transmit instructional programs during the school day. It is estimated that one-and-a-half to two hours of television instruction will be received by each student each day--comprising about a third of the student's instructional day. The decision as to which portions of the curriculum objectives can be most effectively taught through the medium of television will need to be made by Korean researchers after careful analysis of all the objectives. There are some characteristics associated with the proposed television teaching which are not often found in other televised teaching programs.

Television as a means of learning in schools is not new and has been in use in many schools in the United States for twenty years. Its contribution to genuine educational reform has not been great in the United States (as contrasted to El Salvador or American Samoa) for a variety of reasons. Conventional instructional television compares favorably with live classroom teaching but is not dramatically superior. Televised instruction has been shown to be as good as live instruction and in some cases better. The project in American Samoa has shown that carefully prepared but conventional instructional television is consistently superior to live but poorly qualified teachers. The term "conventional" is used here to describe the type of instruction which is most often televised for school consumption. This usually involves selecting a teacher who is judged to be superior in speaking ability and appearance, who is enthusiastic in his presentation, and who has an appealing personality. Teaching programs are then designed by the teacher and the television production staff. The result is rather conventional teaching of much slicker presentational quality. Typically, these courses have not been built on the principles of programmed instruction that were described earlier; rather, a good teacher is used to lecture and demonstrate before students in much the same way as an ordinary classroom teacher does. This is sometimes referred to as the "talking face" approach to televised instruction.

This kind of conventional televised instruction has real advantages over at least some classroom instruction that are probably obvious. A good teacher can provide instruction for a very large number of students who otherwise would receive this instruction from a number of teachers (the average of whom would most likely be less proficient than the television teacher). If the number of students who receive a course over television is large enough, the cost of developing and transmitting the course becomes very low per student. However, these costs advantages are lost if the televised instruction is simply added on to the curriculum rather than substituted for portions of it. Even in these unimaginative formats, instructional television has proved its worth in the classroom.

Programmed Television Instruction

There are recent developments which suggest that television has much more to offer education in the future than it has in the past. A number of instructional television producers have built programs employin the developmental principles of programmed instruction with good results. James Wilkey of the Parks California Job Corps Center designed and develo TV sequences where the behavioral objectives were carefully detailed; scripting and story boards were developed for these ordered objectives and videotapes were produced. Students with prescribed entry level qualifications were then taught by the television programs, and the videotapes were revised as teaching deficiencies of the TV program were revealed. Using pre- and post-test measurement, Wilkey was able to show gain and predictable terminal learning solely attributable to the televised instruction. The Sesame Street children's educational television production in the United States has demonstrated that coupling the principle of programmed instruction with good dramatic television production will yield programs which are interesting and, more important, will teach youngsters who are widely varied in age and socio-economic background.

The Experience in El Salvador. In 1968 El Salvador undertook a major educational reform with educational television central to the effort. They have been concentrating in the first phase of the program on the middle school level. The important feature of this exemplary effort is that the introduction of television was used as a device to introduce into the schools other important innovations and improvements, such as teacher training, objectives development, new program and materials development and curriculum reform.

The Institute for Communication Research of Stanford University recently completed an evaluation of the first years of the project and reported:

> "We see that television is not only a medium of instruction but a a catalytic agent for change in the system. A major technological change has forced its own logic upon those who decided to use it. El Salvador's educational leaders seem to have understood and accepted the implications that this innovation has for structural changes that go far beyond the placement of a piece of hardware in a classroom. There have been no other tests on a national educational system of the kind that is underway in El Salvador. To our knowledge no other country has accepted so completely the implication that educational technology carries with it." (McAnany, Mayo and Hornik, 1970).

The reform effort of El Salvador is a dramatic demonstration of what can happen when the top leadership of a country decide that their country can no longer tolerate an obsolete and inefficient educational program. In the case of El Salvador, much of the credit must go to Walter Beneke, a courageous and imaginative Minister of Education, who had the full support of his President. One of Beneke's first steps, in 1967, was to reorganize the Ministry of Education so that the television reform effort was set up as a separate division within the ministry structure. With this status, the television division had autonomy and flexibility to develop, unencumbered by the bureaucratic traditions and inertia that often plague large organizations like ministries of education.

One of the most significant actions taken by Minister Beneke was the appointment of a commission to reform the curricula for grades one through nine. Guidelines for the new national curriculum were set forth which, for the first time, included consideration of objectives, activities, teaching methodology and guidance, and evaluation. These guidelines became the basis for the actual reworking of the whole curriculum by subject and grade level.

It is too early to regard the El Salvador instructional television project as fully evaluated--further development and evaluation is a continuing process. But the results thus far have been most encouraging and the El Salvadoreans are pushing ahead with their program, confident that their efforts are paying off. ITV is providing an alternative to single source learning and the rote system of passive memorization. The result has been more active participation and increased learning on the part of the student. Students in the new courses are learning more than control students in conventional classes. This increased learning gain occurs pretty much the same independent of social level, rural or city origin, sex or ability level of the students. Earlier concern that only the abler students would profit from the ITV courses proved to be unfounded.

Feasibility of a Korean Educational Television System. When during the analysis of this study, the study team concluded that television was a needed and desirable instructional resource, a preliminary feasibility study was made by the educational technologists. The results of this study were positive in most respects and are reported on in somewhat more detail in Chapter Seven. In summary, it showed that the engineering survey work for a national network of television utilizing microwave transmission had already been done and that there existed a central programming and transmission facility in Seoul and that the microwave relay elements were in place. These resources are not large enough to permit the educational TV system to "piggy-back" upon them but much costly planning and engineering work will be saved because this earlier work has already been done. There is also a substantial technical capability available in Korea related to television, ranging from program production to television set repair. Further, high quality television receivers are produced in Korea with an estimated unit cost plus a fair manufacturer's profit that would not be prohibitive.

In short, TV sets can be made available, programming and maintenance capability exists, and a working prototype for central transmission and nationwide relay is in place. It is estimated that a functional national educational television system could be built and installed for $6.5 million. This would include a television set for each instructional unit of 300 students, plus an inventory of replacement sets for maintenance rotation. This figure does not include program development costs. The survey showed that many Korean schools do not have electricity wired to the classrooms. However, many schools have electricity to the building and almost all (except for a few in very remote villages), have electricity to the communities in which the schools are located. The study team was unable to determine what the cost of adequate school electrification would be but estimate that it would be possible. anything is possible if
what are the absolute numbers of facilities that
need electrification.

The Characteristics of the Proposed Television Instruction. The proposed introduction of national educational television into Korean schools will differ in at least one way from the manner it was introduced into El Salvador. In Korea, television will be an integral component in the system of instructional resources, it will not be the central instructional medium to which other innovations are appended. The employment of ITV may well make more palatable other changes in the instructional process, as has been shown in El Salvador, but that is not its main purpose.

It has already been stated that the instructional television for the elementary-middle school system will be a form of programmed instruction, developed to teach specific behaviors and calling for active responses from the students. The programs will require the students to covertly converse with the TV teacher--to answer questions and to recite. Developed to go with the TV programs will be auxiliary printed materials. in which the student will write responses, solve problems and record his reactions and questions. These will be used by him in group work with his own teacher and fellow students following the TV presentation. These follow sessions will be used to reinforce and expand what the student has learned from the TV. It is emphasized, however, that the instructional load and responsibility for the student's learning the portion of the curriculum taught in this mode is to be borne by the televised teaching and associated work materials.

Student learning from the televised sequences will be as closely monitored as with the individualized student learning units. The teacher will be furnished supportive and supplementary materials to help her work individually with any students who experience difficulty with or fall behind in the televised instruction. This provision, not usually made for instructional television, is necessary because TV, unlike the individualized student learning units, is group paced and some students will invariably fall behind. If detected at once, the problem can be immediately remedied, while if these deficiencies in understanding are allowed to accumulate, they become difficult to remedy.

Programming television and developing support materials in the fashion described here result in large, if non-recurring costs for development and validation. When the cost of any given program [illegible] amortized over the nearly one million children learning from that program, the costs become bearable if not insignificant. Further, these programs will be designed to effectively replace the teacher for a portion of the instruction and the programs should be reusable, with minor revision for several years.

A note of caution should be raised here. A tragic if not criminal mistake that has been historically associated with decisions to install televised instruction in a school system has been to assume that purchase and installation of hardware represented the bulk of the required capital outlay. The programs in El Salvador and American Samoa are noteworthy exceptions to this fallacious thinking. The cost of development of the student learning units, teacher materials, the television programs and the evaluation and student performance assessment instruments, is much higher than the equipment investment. Unless an adequate financial commitment is made to software development, it would be better to make no hardware expenditures. The development tasks and associated costs are described in subsequent chapters.

Instructional Radio. Fortunately, the educational bias against radio as demonstrated by the low key role played by instructional radio, in the United States during the past fifty years, has not been exported to other countries where, in some instances, the radio has been assigned a vigorous role in education. An example of how the potential of radio technology has been utilized is in the Democratic Republic of Congo which began educational radio in 1963. Medium wave, FM, multiple channel and short-wave radio distribution systems comprise a cluster of significant planning factors for the design of media systems. Particular reference should be made to the greatly increased range of educational services offered by developments in simultaneous multiple transmissions--multiplexing. This delivery technology which allows one or more subcarrier's signals to be carried on main channel transmission, results in adding educational broadcasting channels. A precise application of this method of distribution for instruction can be found in EDUCASTING, a patented commercially available instructional service which uses three FM subcarrier channels to transmit responses to students and the main channel to transmit course content and question items.

In the proposed Korean elementary-middle school, it is anticipated that radio instruction will be used in the context of the individualized program and be one of the instructional resources to which the student is directed. There will be a number of small, inexpensive transistorized radios with ear pieces available to each instructional unit. The same principles applied to the development of the student learning units and the televised instruction will govern the development of the radio instruction. Certain of the educational objectives will need oral presentation (language training, for example). These

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instructional sequences will be prepared and broadcast, repeating the broadcast at staggered intervals. These sequences will be encoded to the objectives just as other instructional resources are. The student will have available a broadcast schedule for instruction telling him the frequency and next broadcast time of the radio segment to which he has been directed. He will check out from the teaching staff a radio with earphones and tune into the instruction when it is scheduled. Potential uses might include historic speeches, oral drill and practice, music education and straight information presentation.

A Reorganization of Instructional Patterns

Sweeping and drastic changes have been recommended by the study team in the educational processes for the Korean elementary and middle schools. It is believed that the scope and magnitude of Korea's educational problems are so great that anything short of a major overhaul of the system will not have a meaningful impact. The decisions and commitments will not be easily made nor can they be made without disruption of the present educational system. The program, as described here, probably sounds confusing and disjunctive. However, if well planned and carefully developed through time, the study team believes it can result in a pleasant effective learning environment. No matter how technologically sound and efficient the educational system becomes, it will be no better than the objectives it is designed to meet. In a loose, inefficient system, vague educational goals are tolerable because no one knows for sure whether they are ever attained. In a well engineered educational program, the objectives are of paramount importance because the probability is high they will be achieved by students, whether they are relevant or irrelevant, important or inconsequential,

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good or bad. Deciding upon the appropriate educational goals and operationally defining these into specific instructional objectives is a task of enormous importance to the future of Korea.

The study team believes that a system can be designed which will prepare all Korean young people for self-fulfilling lives and equip them to be socially and politically sophisticated citizens. They can be prepared for employment and continuing life-long learning and intellectual growth. They can be prepared to derive more pleasure and reward from esthetic forms in their culture. They can be prepared to be a more effective family member and neighbor. They can also be prepared for things in addition to or instead of these.

The kind of individualized program being recommended by the study team will work best if continuous progress of each student is permitted. It has already been observed that students will progress through the program at variable rates. They should be allowed to move steadily along without being halted at artificial barriers of grade levels. When a student has completed the math objectives for the sixth year, he should move directly on into the next math objectives whether or not it is time or he is the right age level to move into the seventh grade.

The ungraded, continuous progress school will be facilitated by combining into a single school unit the elementary and middle school programs. The study team has been advised that there will be a strong public and professional resistance to such a move, partially because of tradition and the mystique associated with the rites of passage from the elementary to the middle school. Nevertheless, the study team recommends this consolidation if it can possibly be done. It would provide for a much more efficient use of school facilities and resources.

It would reduce mean student-to-school distance and travel time. It would give greater flexibility to school assignments for students. It would allow intermingling the better qualified middle school teachers with the generally less qualified elementary faculties.

The flow of students through the elementary-middle school program and the subsequent post-ninth year options are shown in Figure 4-3.

An important output characteristic of the proposed elementary-middle school program hypothesized by the study team is that, in addition to pre-occupational preparation, all the graduates will be as well prepared academically as today's high school graduate in Korea. Even so, some students will be better prepared than others, just as some students will always be more intelligent than others. If Korea continues to admit students to the college preparatory, academic high schools on the basis of achievement and ability, maintaining approximately the present rate of admission, today's academic high school curriculum will not be sufficiently rigorous nor advanced for the future student.

A last substantive recommendation to be made by the study team will relate to a reorganization of the vocational, technical and job-training programs of Korea. The outcome changes that will result from implementation of the proposed elementary-middle school will change the needs of the occupational training programs because the entering trainees will be differently prepared than is presently the case. The proposed reorganization of the occupational training programs is presented in the next chapter.

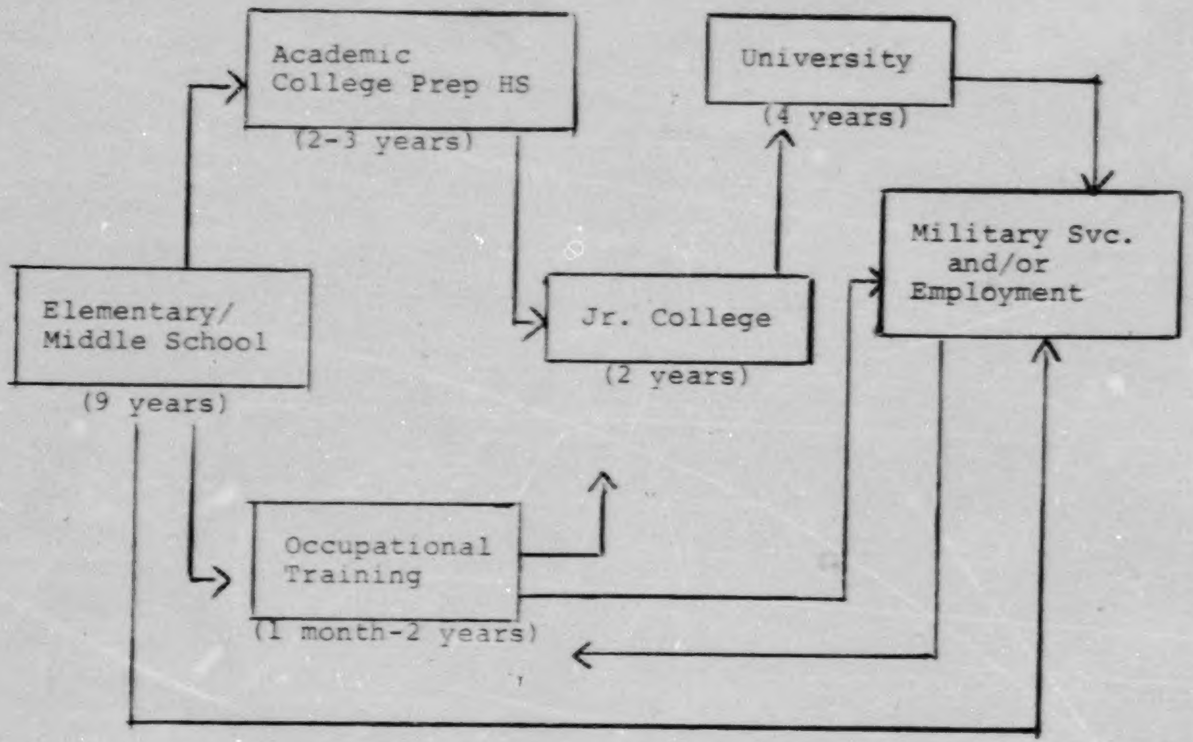
Academic
College Prep HS
(2-3 years)
University
(4 years)
Military Svc.
and/or
Employment
Elementary/
Middle School
(9 years)
Jr. College
(2 years)
Occupational
Training
(1 month-2 years)

Figure 4-3. Student Flow Options Following Completion of Elementary--Middle School.

CHAPTER FIVE

THE REORGANIZATION OF OCCUPATIONAL TRAINING IN KOREA

The part of education about which Korean leaders, both governmental and educational, invariably expressed the greatest concern was vocational preparation. The study team feels this concern is amply justified, a conclusion which has led to the team's strong recommendation to add, at both the primary and middle school levels, a substantial offering in preoccupational preparation. The learning of the specific technical job skills needed at the time in Korea's economy can then be readily acquired on a minimum training time basis. The graduates of the proposed nine-year curriculum will have solid academic preparation at least comparable to today's Korean high school graduates and will also be well grounded in the general fundamentals prerequisite to specific job training. These changes will make the vocational-technical high schools, as they presently operate, obsolete, irrelevant and unnecessary.

What will be needed is a system of job training programs which have the following characteristics:

a. The training will be exclusively related to specific jobs that will be available as students complete the training. The kind of manpower needs forecasting described by Nicholas DeWitt in his MUCIA paper will be essential for these purposes.

b. The programs, growing out of short range (two years or less) manpower needs predictions will be of variable duration, the training being no longer than is minimally required to prepare the trainees for the specific jobs. These programs would vary from four weeks to two years in length.

c. The system would provide for the start up of new training programs, with the shortest possible lead time as needs change. By the same token, programs would be terminated when they are no longer needed.

d. These programs would be staffed with personnel who know the job skills being taught with much less emphasis on degrees, teacher certification or other formal educational requirements.

e. These schools would not only train middle school graduates, but also be used for retraining of adult employees as personnel needs changed.

f. There would need to be a very close liaison and coordination between the appropriate governmental agencies (MOE, MOST, OLA, etc.) and the private sector to maintain the optimum cybernetic relationship between training output and manpower utilization. What is not possible in this respect in the United States should be quite feasible in Korea.

Vocational Education: General Overview

Vocational education is an important area of secondary education served by six separate groupings of institutions with general and specific objectives attempting to conform to the government's desire for "rapid progress in the work of its modernization. . ." (Japanese National Commission for UNESCO, 1969). Korean education laws are not specific in terms of the vocational schools. Vocational schools are not specifically mentioned in Articles 104 and 105, the general high school laws, but are noted in Article 156 which designates high schools with more than 30 percent vocational class hours as vocational high schools and Article 128.2 which sets forth the specific aims of the higher technical school (only one of the six forms of vocational education). A complete but separate set of vocational training laws has been formulated to govern the vocational training activities of the Office of Labour Affairs which is currently somewhat limited in its mandate.

The various vocational programs can be subdivided as follows:

A. Vocational High School
    1. Agricultural Training Program
    2. Technical Training Program
    3. Commercial Training Program

4. Fishery and Marine Training Program
5. Comprehensive Program
6. Fine Arts Training Program
7. Others

B. Trade Schools

C. Higher Trade Schools

D. Vocational Training Schools

E. Private Vocational Institutes

F. Junior Technical Colleges

G. Vocational Training Programs of the Office of Labour Affairs.

Data on the number of schools (public and private), students, teachers and graduates in 1969 is provided in Table 5-1. Objectives which have been stated for these schools may be found in the report, National Statements on Educational Goals, Aims, and Objectives of the Asian Countries (Japanese National Commission for UNESCO, 1969).

Entrance and movement into these schools is indicated to a distinct degree by Figure 5-1. In general, movement is as expected. It should be noted that private vocational institutes can be entered from any level at almost any time (after age 12, approx.). Of the 99,000 students attending private institutes in 1969, 17,000 had completed primary school or less, 3,000 had entered after dropping from middle school, 16,000 after completing middle school, 4,000 after dropping high school, 20,000 after completing high school.

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assume
39,000
adults etc.
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age compo

The establishment of such private institutes is subject to approval either by the Board of Education of the specific city or province or by the Education Office of a city and county. Private institutes are also required to subject themselves to administrative supervision by such government agencies.

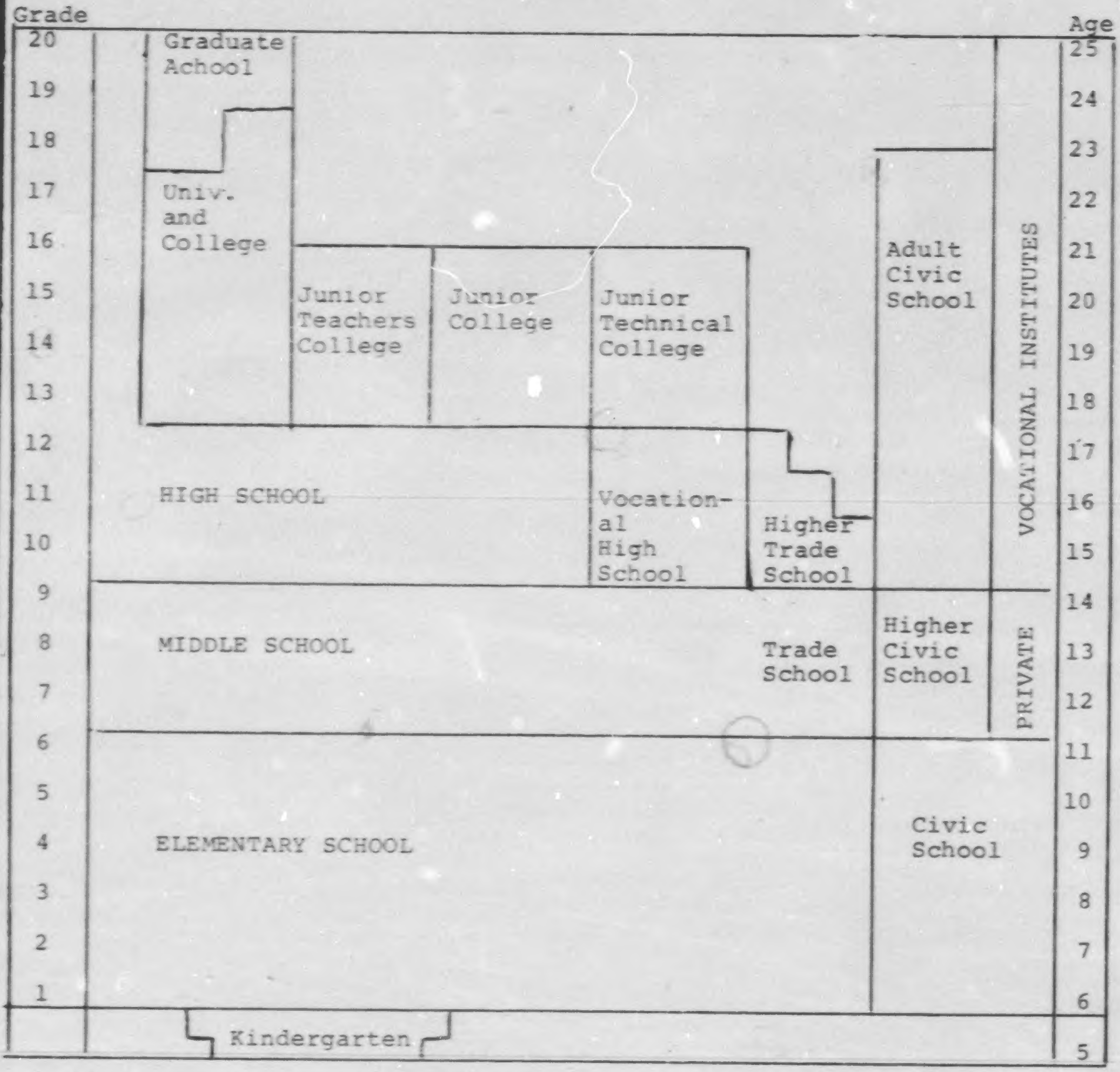
Table 5-1

Vocational Program Information*

Program	Number	Students	Teacher	Graduates in 1969
1. Vocational High School	444 275 Pub. 169 Priv.	235,809 125,670 110,139	8970 5662 3308	57,023 32,604 24,419
2. Trade (Technical) Schools (Public)	69	13,326	522	3,003
3. Higher Trade Schools (Public)	66	10,466	567	5,245
4. Vocational Training Schools	27 26 Pub. 1 Priv.	3,174	179	NA
5. Vocational Institutes (all private)	1,337	99,126	4689	NA
6. Junior Technical Colleges	23 15 Pub. 8 Priv.	20,741 10,589 10,152	1034 648 386	2,026 1,264 762
7. Miscellaneous Sec. Schools	NA	8,432	336	904
8. Vocational Program of OLA	133	25,212	NA	13,000 (est)
9. Total	2,099	415,286	16,297**	81,201**

* Adapted from Education in Korea: 1968-69, Ministry of Education, Seoul, Korea 1968.

** Data Incomplete.


Grade
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19
18
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12
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4
3
2
1
Age
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13
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5
Graduate Achool
Univ. and College
Junior Teachers College
Junior College
Junior Technical College
HIGH SCHOOL
Vocational High School
Higher Trade School
Adult Civic School
VOCATIONAL INSTITUTES
MIDDLE SCHOOL
Trade School
Higher Civic School
PRIVATE
ELEMENTARY SCHOOL
Civic School
Kindergarten

Figure 5-1. Korean Education System Organization

(Adapted from Education in Korea: 1968-9)

Diverse courses of education are provided in such private institutes, namely, liberal courses of English language and mathematics and such technical courses as hair-dressing and barbering, radio communication, communications, mechanics, automobile driving, radio, music, dancing, movie technology, knitting embroidery, dressmaking, cooking, typing, accounting, drama, oratory, painting, television repair, refrigerator repair, telephone operating, industrial arts, stenography and nursing. These school courses are offered to prepare students for employment or to help them acquire technical skills, and/or for their hobbies. Courses are part time, usually after work or after other schooling.

By occupation, the number of students at these private institutes is 29,832 students still attending at regular formal schools and graduates from formal schools, 53,034 persons out of jobs, and 12,260 employed persons. Of the number of students attending these schools, 38,453 students are attending institutes that have liberal arts and science courses. For the most part, they attend the private institute in order to prepare themselves for advancement to high schools or to prepare for national college and university entrance examinations. Table 5-2 summarizes the status of these students.

The main program for vocational education is the vocational high school program. In 1969, 235,809 students were attending vocational high schools (see Table 5-3). The basic subdivisions within the vocational high school and the numbers of students entering and completing programs are shown in Table 5-3.

Much of the information on the success of the various programs is unclear. An extensive study prepared by CERI in 1967 showed that

Table 5-2.

Present Status of Private Institutes
(as of April, 1969)*

Category	Number of Institutes	Number of Students			Average Class Hours Monthly	Average Monthly Charges (in Won)
		Total	Male	Female		
Total(or av.)	1,332	99,132	52,816	46,310	5.8	987
Liberal Science	250	38,453	26,926	11,527	7.3	772
Technical	236	18,474	14,232	4,242	5.6	1,298
Arts	243	9,621	3,596	6,025	7.2	1,096
Home Economy	333	12,764	1,425	11,339	5.0	990
Clerical	161	11,764	3,754	8,004	3.9	875
General	62	5,472	1,896	3,576	5.1	626
Other	47	2,584	987	1,597	6.7	1,251

*Source: Central Educational Research Institute.

Table 5-3.

Student Information for Vocational High Schools

Course	Total Students	Freshman Quota	Applied	Entered	Graduated	Entered Higher School	Employed	Percentage in H. Ed. or Employed
Agriculture & Forestry	49,534	21,400	23,035	18,913	13,418	1,345	4,932	46%
Engineering	63,611	26,160	53,696	24,868	14,341	932	8,532	66%
Commerce	102,643	41,040	74,237	39,181	25,077	2,121	12,035	56%
Fishery & Marine	3,579	1,620	1,720	1,383	836	53	460	61%
Home Economics (all female)	4,221	2,370	2,248	1,782	821	69	189	31%
Arts	1,115	600	422	388	357	177	20	55%
General	11,106	5,160	6,191	4,660	2,173	776	264	48%
	235,809	98,350	161,549	91,175	57,023	5,473	26,432	48%

of the total graduates from vocational high schools over the past ten years 18.3% proceeded to higher education, 20.4% went into military service and 61.3% went into the labor supply. Of those in the labor supply, 48.6% were employed in occupations not related to their training, 30.3% were employed in occupations related to their training and 21.1% were unemployed.

The content of the various vocational programs is, to a distinct extent, dictated by the Ministry of Education. Vocational programs are to provide both a general education and specific vocational training. Vocational training is 55% of the amount of time with approximately one-half of this to be direct "shop" or "experimental" experience and one-half lecture. General education is 45% of the total time and contains exactly the same courses as the academic high school, except for less total time. An example of this distribution of time is shown in Tables 5-4, 5-5 and 5-6. A certain amount of flexibility in the curriculum is exercised by almost all schools in terms of minor schedule adjustments, but in general, the 45-55% guidelines for academic vs. vocational subjects is followed.

Teachers in public vocational schools are required to have a bachelors degree or the equivalent, and approximately 81% do have the degree. And 13% have junior college or equivalent, leaving only 6% below that level. Turnover rate was reported by CERI (1967) at 8.1% and is currently estimated at 10%. This rate is approximately twice as high as that of the academic high school and is about the same as the primary level where the problem is considered to be very serious.

Current Organization

The official organization of vocational efforts in Korea is

Table 5-4.

Required Courses of Academic High School

Course	Unit*
TOTAL	104
Korean Language	24
General Social Studies	4
Ethics and Morality	4
Korean History	6
World History	6
Geography I	6
General Mathematics	8
Biology I	6
Physical Education	24
Music I	6
Arts I	6
General Management	4

*A unit means one class hour per week for a semester.

(From Education in Korea: 1968-69)

Table 5-5.

Elective Courses of Academic High School

Courses	Liberal Arts	Natural Sciences	Vocation
TOTAL	100	110	104
Korean Language I	18	--	--
Politics and Economics	4	--	4
Geography II	6	6	6
Mathematics I	12	--	12
Mathematics II	--	26	--
Physics I	6	--	6
Physics II	--	12	--
Chemistry I	6	--	6
Chemistry II	--	12	--
Geology	4	4	4
Biology II	--	6	--
Agriculture Engineering Fisheries and Marine Commerce (one of them for boys)	14	14	38
Home Economics (for girls)	14	14	38
Foreigh Lang. (one or two among English, French, Chinese and German)	30	30	--
Chinese Character	--	--	6
Composition	--	--	4
English	--	--	18

(from Education in Korea: 1968-69)

Table 5-6. Course Units* Allocated in Vocational High Schools

	General Subjects			Professional Subjects			Grand Total**
	Req.	Elec.	Total	Req.	Elect.	Total	
Agricultural High School	52	38-50	90-102	52-78	24-68	114-120	204-222
Technical High School	52	36-48	88-100	86-122	0-36	112-120	204-222
Commercial High School	52	38-50	90-102	58-106	38-60	102-120	204-222
Fish. & Marine High School	52	30-37	82-89	18-30	97-103	115-133	204-222

*Unit equals one hour of course per week for one semester

**At rate of 34-40 hours per week for six semesters

(Adapted from Education in Korea: 1968-69) represented in Figure 5-2. The bulk of the schools are generally under the central Ministry of Education (MOE) through the provincial Boards of Education (BOE). MOE has a relatively small staff assigned to overseeing the vocational schools so the bulk of the responsibility falls on the provincial BOE's and the specific principals. A special group of programs is operated by the Office of Labour Affairs as a supplement to the general vocational training situation. This effort includes about 25,000 trainees each year and is growing. An expanded description of these activities will follow in a later section.

MOE prepares only the basic plans or frameworks of the vocational policies and the local (provincial) boards are then responsible for implementation of the policies and overall control of the schools.

Major Problems in Korean Vocational Education

Several major problems are apparent in Korea's vocational education programs. These problems include a goal/conceptualization problem, a problem of distinct lack of responsiveness of the training system with courses being too lengthy and the system being unable to readily adapt itself to new requirements, facilities problems, staffing, equipment and assessment problems. The first of these is certainly the most critical.

Goal/Conceptualization

Vocational education in Korea has a goal problem. Its basic purpose--to disseminate skills and knowledges about general and specific vocational areas--is subverted by a group of factors. First, many of its students have academic rather than vocational intentions and attempt and do progress to higher education after they complete

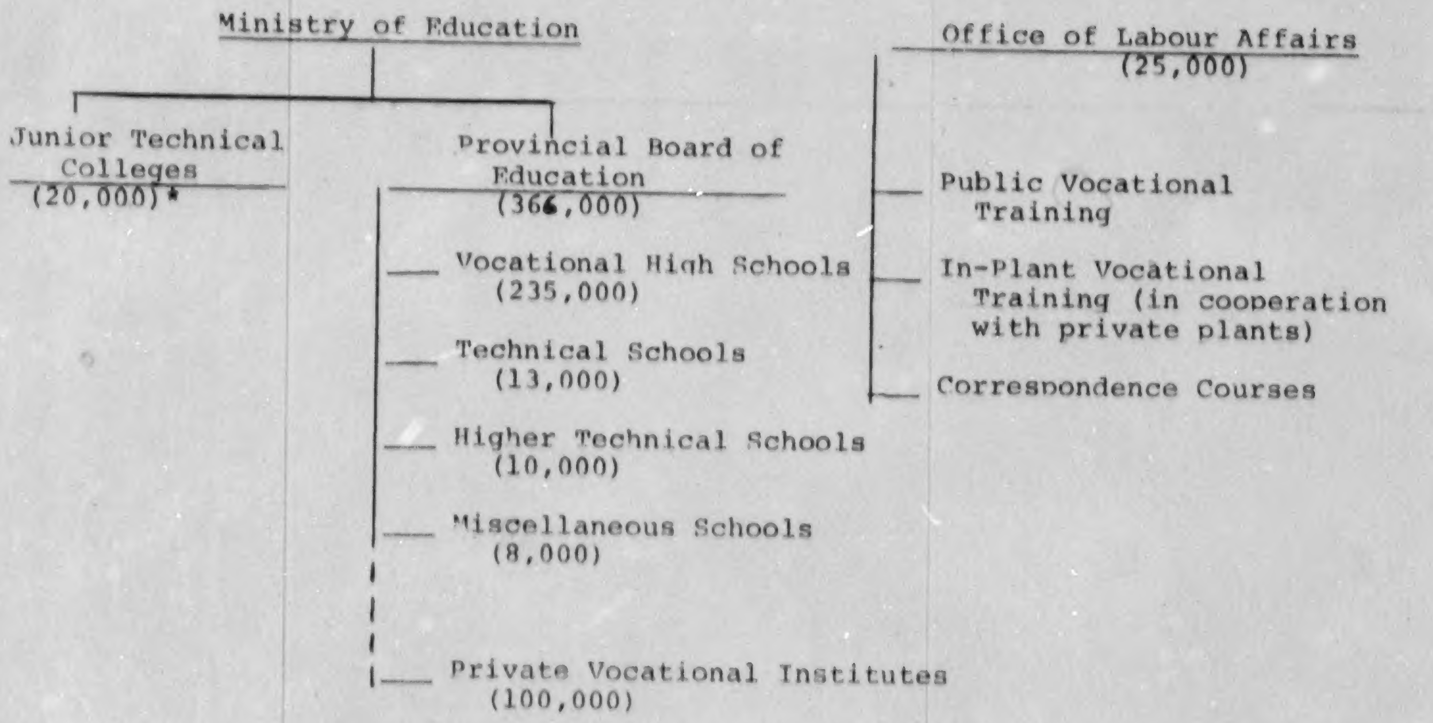
Ministry of Education
Junior Technical Colleges (20,000)*
Provincial Board of Education (366,000)
Vocational High Schools (235,000)
Technical Schools (13,000)
Higher Technical Schools (10,000)
Miscellaneous Schools (8,000)
Private Vocational Institutes (100,000)
Office of Labour Affairs (25,000)
Public Vocational Training
In-Plant Vocational Training (in cooperation with private plants)
Correspondence Courses

Figure 5-2. Current Organization of Vocational Education in Korea

* Figures are the approximate number of students in each unit.

their vocational program. This is because in many ways the "academic" education is more "vocational" in terms of allowing students to obtain jobs. This fact is attested to by educators and businessmen in all parts of Korean life.[1] To a certain extent the vocational schools are aware of this situation and tend, therefore, to emphasize the "general" aspects of their education in hopes of providing well-rounded, flexible students. It seems apparent that academic education provides better entrance into almost any vocational area than the usual vocational education. While those in favor of vocational education have been attempting to expand and up-grade such education,[2] it is important to note that in figures cited by CERI (1967), only 30.3% of graduates of vocational education programs are working in "training related" occupations.[3] This may be caused by several factors. For example, it appears that personnel are being trained for areas for which there is no particular demand, such as architecture and mining, where only 6.5% and 7.9% of graduates were able to find study related occupations.

This point is even more valid in fisheries high schools. Employment prospects are expected to drop by one-half over the next fifteen years (Council for Long Range Educational Planning, 1970), and only

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[1] Point was stressed by researchers and officials in the International Labour Organization and the Vocational Training Bureau of the Office of Labour Affairs.

[2] The need for the vocational high schools to provide a good general education will be precluied by the proposed elementary/middle school programs (see Chapter Four).

[3] A similar phenomena is reported in Africa by Philip Foster (1965).

8.0% of fisheries high school graduates are finding employment in training related areas (CERI, 1967). Further, of the 67% who went into non-training-related occupations, 87.8% expressed dissatisfaction with their occupation and 79.8% expressed a desire to change occupation (CERI, 1967). Another factor might be that the quality of training in many areas was so low that the industries were not eager to hire trainees.[4] Another factor might be that personnel trained in one area, such as agriculture or architecture, might find better work in another area such as a clerical employment. It is generally felt that urban migration is a factor here, and it was reported in an agricultural school in Chungchong Pukto that only 20% of their graduates went into agricultural work but that many went into clerical or quasi-administrative areas, generally in provincial and governmental agriculture bureaucracies. Students in these vocational schools frequently see the schools as stepping-stones to better positions in more culturally acceptable areas.[5]

This discussion of overall purposes of vocational education may be related to the specific statements of goals and objectives for these vocational programs. Here is the classical problem in objective setting, that is, the manner in which the objectives are phrased. These objectives[6] are phrased in terms of "developing knowledge," of "understanding," and of "creative ability, diligence and cooperative spirit," in which case the vocational system may be reaching its objectives, but it is not possible to know by examining job placements. It is possible to sidestep this vagueness in objectives by going to another source, the Council for Long-Range Educational Planning's (CLEP) 1970 five-year plan for educational development which suggests an objective of meeting manpower requirements for national development. This goal suggests that graduates trained in a specific area should enter the work force in that area, ready and capable to contribute their specific skills to that area. The projects of the Ministry of Science and Technology (MOST) and the Economic Planning Board(EPB) tend to focus on this type of approach, but the performance of the vocational schools in placing their graduates into "relevant" areas is, as has been noted, not good. The entire purpose of the newly developed Office of Labour Affairs (OLA) vocational operation is to attempt, in part, to rectify this problem, but while it is a good program, it is at best only an ad hoc operation grafted on to a weak overall system as one might put an expensive new afterburner on a very old jet engine.

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[4] This point has been emphasized by several people including Dr. N. Dewitt, but it represents verbal reports of employers rather than firm data.

[5] A point also made by Foster concerning Africa (1965).

[6] For example, those given in Korea's statements of educational goals found in the National Statements on Educational Goals, Aims and Objectives in the Asia Countries (Japanese National Commission for UNESCO, 1969).

Along with unclear objectives and purposes, many of the training programs are much too long. Obviously, they would all be cut in half if the academic requirements were deleted (see Table 5-6). Further, as it now stands, the distribution between required courses and electives varies with the type of training being provided, ranging from 30 units of required professional study in fisheries and marine schools to 122 units of required study for technical high schools. Despite this distribution all students are required to complete the same number of total units. These training courses are too long, and the vocational system is resistant to changes which would make it more responsive.

Staffing

Concomittant with the goal problem is one of general program inadequacy in equipment, facilities, staffing and related areas. Staffing is very important and the results of competition with industry lead to a "remnant" staff. The best graduates of the colleges go immediately to the better paying industrial positions. Graduates of certain vocational education preparation schools, along with many of the less fortunate or less prepared graduates, choose the positions as vocational teachers. After three to four years, many of these people leave the schools for employment in the industrial sectors at higher rates of pay. The result is that the continuing staff of vocational education is the remainder of these two selection phases, pedagogically oriented members whose direct industrial experience and responsiveness is lowest. (Similar findings have been noted by Mrydal, 1968, in other parts of Asia.) A responsive system would be employing those teachers with the most industrial experience, not the least.

Facilities and Materials

The staff problem is compounded by a problem of a lack of adequate equipment and supplies for vocational training. Most vocational training programs require extensive laboratory equipment, such as lathes, tooling machines, carpentry equipment, etc. Rarely is the equipment available and frequently what equipment is available is outmoded, and skills learned on such machinery are not necessarily transferable upon graduation. Utilization of equipment is not adequately planned either. The study team saw only one group who had scheduled their equipment for at least eight-hours-a-day, six-days-a-week utilization, and this was an OLA operation. At the other extreme, one operation was seen where the number of students utilizing the equipment over a period of weeks was only a little larger than the number of machines. These machines were idle almost all the time.

Also in very short supply were the materials which the students needed to practice the skills they were learning. This was particularly noticeable in the sheet metal training programs where widespread use of cardboard as a substitute for metal was seen.[7] The MOE provides 100,000 Won per class (approx. $320 U.S.) in the vocational schools for purchase of materials. Provincial Boards add a like amount and students contribute also, but the total amount available is not sufficient. How much does $641.00?

Assessment

The assessment situation in vocational education is vague. Attendance structure emphasizes time spent rather than educational milestones completed. The curriculum structure emphasizes amount of time engaged in various activities, not the adequacy (quality) of those activities. Most programs are based on a general estimate of the appropriate amount of time which should be spent on the vocational subject, such as thirty weeks, or three years. Many programs have identical time periods despite the fact that the amount of material to be covered in the programs is different. Some programs

Good point

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[7] The use of cardboard seemed an admirable substitute under the circumstances.

are inordinately wasteful of time and resources, requiring "study" for longer than apparently necessary. This results from administrative necessities not program necessities.

A closed loop concept of assessment definitely does not appear to be in effect in any of the programs. The degree to which objectives are clearly stated is low, with apparent fluctuation between various programs. Some basic knowledge objectives are established including general and skill knowledge, in some cases stated with a high degree of specificity (for example, see CERI, 1967, Appendices). Since some of the schools report a consistency between the "basics" and their current practices of over 90 percent, the critical area is the adequacy of the statements of basic matters. Extensive information on the basic content is not available.

Summary of Problems

The result of these factors of lack of responsiveness, low quality staff, lack of equipment and materials, plus the social/cultural factors, leads to the operation of many vocational schools as low-grade or second-rate academic schools which spend less time on both the academic and vocational subjects than they would if the duality was not there. The result of the duality is, in terms of output, that it is costly to maintain.[8]

As a general observation then, the quality of instruction in vocational schools is particularly poor because of the shortage of adequately qualified personnel, inadequate equipment, and frequent ignorance of the needs of the employing establishments in Korea.

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[8] Myrdal (1968) notes this same phenomenon in Southeast Asia.

Students are trained for fields in which jobs are not available, and it is common for graduates to seek positions in areas which are not related to their training, but which have a higher social value. Many of the people applying to and entering vocational school do so only because they were unable to enter an academically oriented school. The resources available to the vocational area are, therefore, not focused upon the primary mission of the area. To a distinct extent then, Korean vocational schools are little more than high cost producers of non-technical, inadequate manpower not fitted to the needs of the country. The vocational schools serve a function only of providing a second-rate academic or general education under expensive circumstances.

What Should Be Done

Based on the observations of the Korean vocational education systems and upon extensive discussions with Korean educators a group of changes which should lead to a more responsive system have been outlined. These changes are:

1. Deletion from the vocational education sector of all academic or "general" courses so that vocational education focuses primarily on the preparation of students in those skills and knowledges required within the vocational realm. This should be done by placing full responsibility for general and academic education areas within the new primary-middle school curriculum (as discussed in Chapter Four).
2. Increased and carefully coordinated involvement of the commercial, agricultural and industrial sectors of the Korean economy in the selection, design and operation of vocational education programs. Course establishment, implementation and duration should grow out of or follow short-term manpower needs projections.
3. Establishment of a strong vocational education curricular design and development organization with responsibility for analyzing, designing and validating vocational curricula on the basis of the most relevant and recent techniques.

4. Development of innovative staff training deployment and remuneration systems which will help the vocational programs to attract and retain high quality staff in the face of strong competition from industry.

5. Centralized organizational control and coordination of all vocational education programs through an occupationally oriented entity responsive to commercial and industrial needs in the development and execution of programs.

Vocational Emphasis

The first point listed is the most important. If the vocational programs of Korean education are to adopt and engender an orientation of training for vocational skills and knowledges, they must do away with the apparent duality of purpose. A clarification of the intent and goals of the vocational programs may be brought about by the strengthening of general education in the elementary and middle school programs and by deleting the academic (or "general") courses from the vocational training area. One result of this approach is that all students entering the vocational program will already have fulfilled their needs for general education and will know that no more general, i.e., academic, education will be available through the vocational programs. Students entering the vocational option will know that focused, organized programs oriented toward known and specific employment opportunities will await them. In most cases these programs will be relatively short-term, goal-oriented programs emphasizing individualized instructional opportunities and leading to available positions within the appropriate employment sector.

many
→ frustrations
expectations
and delusions
may have created
need [illegible]

A second result of these changes will be that students entering the vocational education program will have completed, during the last two years of their nine year education period, a thorough program of orientation to the vocational programs. This orientation will have included the development of an understanding and appreciation of the role of industry, commerce and agriculture in the national development of Korea, and information, understanding and guidance on the various opportunities and options within the vocational area.

Centralized Control of Vocational Education

The fifth point listed is centralized organization and control of vocational programs. In the current and past organization of vocational education in Korea, the control of programs has been in the hands of three or more organizations each apparently having its own goals. To achieve the form of viable programs which Korea has indicated it desires, a centralized authority is required. This authority will function for control not only of coordination of operation of programs but also for the development of a systematic interface with various commercial, agricultural, industrial and governmental organizations(point 2);programmatic design, development and testing of programs (point 3); and staffing of vocational education (point 4). This organization will require a strong governmental mandate, an important position in the governmental hierarchy, and well developed procedures for close liaison with other interested government agencies. The current Office for Labour Affairs (OLA) is a good example of the type of organization which is required.

This proposed organization should have as its general mandate the development of a responsive and flexible vocational program which is sensitive to the complicated and diversified structure of Korea's industrial and commercial sectors, is designed to promote a maximum amount of opportunity for vocational education to those students so desiring, and emphasizes higher quality in production of trained students through strengthened curricula and organizational and staffing patterns and through systematic evaluation, feedback and change mechanisms.

Six primary functions are required to effectively operate the vocational program suggested here. These functions are: (a) selection of appropriate training areas, (b) design and development of curricular materials, (c) staffing of programs, (d) operation of programs, (e) placement of graduates and (f) evaluation of the total vocational program.

Selection of Training Areas

An important and difficult area is the selection of those vocational areas in which training is to be offered. The development of a series of guidelines and decision-making procedures for the selection must be a first priority in the development of the new vocational training program. Several factors should be taken into consideration in the development of these procedures. The two most important are: (a) the apparent demands of the Korean economy, as reflected in various manpower projections (particularly short-term) from government agencies such as MOST and EPB and indirect or direct requests from industrial, commercial and agricultural organizations, and (b) the wishes and requests for training of the students graduating from the basic curriculum. These two areas must be carefully balanced as neither students nor government agencies are always realistic.

Those courses currently being offered in the vocational program are the logical point of departure for the new selections. Each of the courses must be evaluated in terms of past and present successful contributions. Some course areas have very low placement records. Architecture, mining and fisheries have placed less than ten percent of their graduates in positions in areas related to training (CERI, 1967). The future prospects for fishing, forestry and agriculture should be carefully examined as the Report of CLEP (1970) has suggested opportunities in these areas will decline significantly in the period from now until 1986. The courses currently being offered should be subdivided into segments or clusters of related areas, and the potentialities of these clusters should then be examined.

Design and Development of Curricular Materials

This area is one in which there is considerable room for introduction of new techniques into the vocational system. After the basic program areas have been chosen, the content of those areas must be analyzed and developed into a cohesive learning program designed to optimally present information on the knowledges and skills of the specific unit and insure that a maximum opportunity for learning is available. These changes should be thought of as the carefully coordinated progression from an existing set of programs to a significantly better form of the same programs. Emphasis should be placed on observable program changes, but it is not necessary to postulate the introduction of large units of technology such as educational television. Demonstration and practice of skills might best be handled with a highly trained vocational worker rather than through television. Within this framework, a series of innovations are required. Here is a possible sequence of steps for the design and development of the curricula.

1. Obtain extensive information about the specific job or vocational cluster for which training is to be provided. Establish and utilize procedures such as task description and analysis to systematically gather information. Emphasize identification of skills needed for optimal performance and knowledges needed to interrelate the skills. Identify and elaborate the likely circumstances, surroundings and aspects where performance will be required.
2. Identify the specific training objectives. State clear conditions under which performance is to occur. Describe the nature of the skills and knowledges required, and set levels of performance for the skills and knowledges.
3. Designate a sequence of instruction. Are specific skills and knowledges required before others can be learned? Does a specific sequence increase possibilities for transfer of training to related areas within the vocational cluster? Can segments of learning skills be immediately followed by an opportunity to practice them?
4. Develop instruction. Design and develop the presentations for students in terms of various presentational modes such as lectures, demonstrations, films, workbooks, programmed instruction, etc. Insure conditions for practicing skills as they are learned, in circumstances closely simulating those under which they will be performed (design of laboratory and shop facilities). Allow demonstration of units knowledge as that knowledge relates to the skills in that area.
5. Develop measurement devices. Emphasize use of tests and measurements based on the behaviors taught and in terms of a specified level of performance. Develop schemata for the use of information received from tests grades for students, feedback to system, etc.

An example of a possible instructional sequence is shown in Figure 5-6.

Various authors have done extensive work in these areas and while it would not be appropriate to list all of them here, an indication of a few will help. Under point one, the work of Smith (1964, 1965, 1966) in task analysis is useful. Under point two work has been done by Smith (1964), Mager (1961), Gagné (1964) and Lindvall (1964). On point three the work of Gagné (1968, 1970) and, in the concept of clusters of vocational areas, the work of Tuckman (1969) and Altman (1966) is useful.

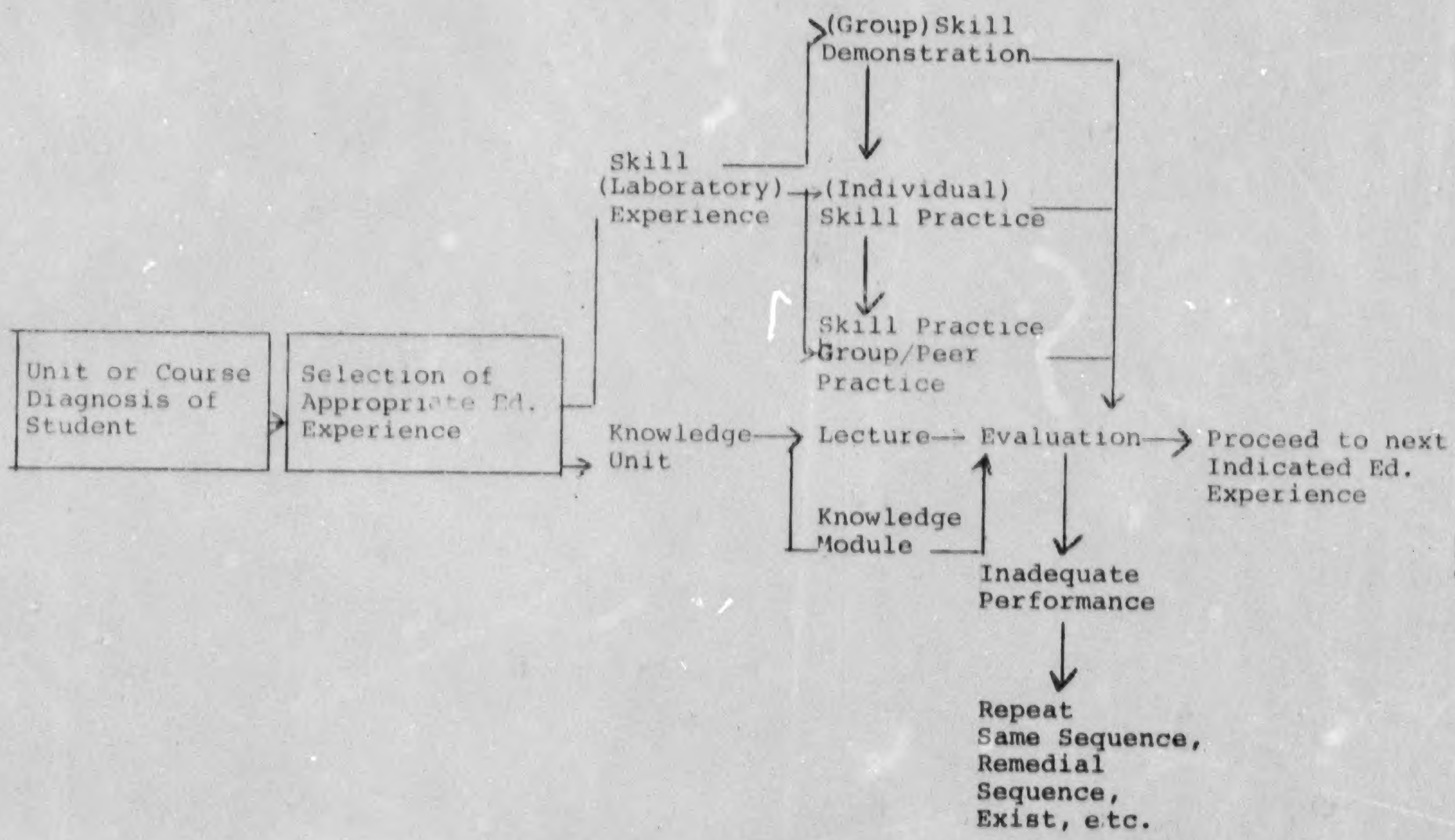
Unit or Course Diagnosis of Student
Selection of Appropriate Ed. Experience
Skill (Laboratory) Experience
(Group) Skill Demonstration
(Individual) Skill Practice
Skill Practice Group/Peer Practice
Knowledge Unit
Lecture
Knowledge Module
Evaluation
Proceed to next Indicated Ed. Experience
Inadequate Performance
Repeat Same Sequence, Remedial Sequence, Exist, etc.

Figure 5-6. Simplified Example of Learning Sequence for Vocational Programs.

Briggs (1970) has made great contributions to point four, as have Tosti and Ball (1969). Popham and Husek (1969) have contributed to the development of criterion referenced testing.

These and other activities make up the curriculum development function. In the development of this function for the Korean vocational education system, further examination of various curriculum models should be undertaken with emphasis on utilizing those models which lead to a maximum amount of relevancy of the material to be learned and a maximum opportunity for learning by the student.

Staffing of Programs

Changes must be made in the staffing patterns of the vocational educational programs because this area is one of the major deficiencies in the current system. Four basic suggestions are made.

1. Raise salaries of vocational instructors by an amount sufficient to make these positions competitive with industry. While this change is drastic, it is necessary. In part, the cost may be justified by the deletion of academic activities in the vocational programs.
2. Differentiate the vocational staff on a functional basis. This should lead to more efficient use of staff skills and knowlege and should help establish a higher student/teacher ratio. To bring about the differentiation will require testing, analyzing and modelling of staffing under the new vocational programs.
3. Training on both the in-service and pre-service basis must be re-analyzed and modified consistent with the nature of the new vocational programs and organization, and new methods of offering this training must be developed.

4. Vocational instructors should be encouraged and, if possible, required to spend one year in five working in a relevant industrial or commercial position where they may refurbish their skills and update their knowledge and understanding of their areas. Temporary exchanges with major corporations would be a useful way to achieve this and would also contribute to the coordination between the programs and the commercial sectors.

These four steps comprise the beginnings of a staffing function for the vocational education programs. They interrelate and should be developed together into a pattern of staffing factors which will remedy the current low quality staffing patterns in vocational education.

Operation of Programs

New patterns are required for the operation of vocational programs within the framework suggested in this discussion. Three factors seem to contribute to the development of new patterns of program operation. These are: (a) the nature and requirements of the program in terms of time, materials and equipment as revealed by a careful analysis, (b) the relation or position of a specific program in terms of its cluster, (c) the degree to which various industrial-commercial-agricultural organizations will cooperate in the operation of the program. In general terms a matrix of these factors might be developed to suggest general guidelines for the interaction of the factors. These general guidelines should then be used as a basis for a careful examination of existing and required programs.

As a general suggestion, the two extremes of industrial cooperation might be along the following lines:

High industry cooperation	Low industry cooperation--high vocational education responsibility
--highly complex equipment required	-equipment requirements low
--objectives stress relatively limited number of skills	-objectives stress development of extensive knowledges and some skills
-training period reasonably short (1 to 6 months)	-training period long (7 to 18 months)
-interrelation of skills to general cluster, low	-interrelation of skills to general cluster, high

Within this schema a number of gradations would be expected. Programs should have ranging levels of industrial involvement,changing overtime as a function of factors,such as availability of equipment and space, requirements for manpower, available tax incentives, etc. Examples of "mixes" within the ranges might be (a) those programs totally operated by various industrial-commercial-agricultural organizations, (b) those operated by these organizations but with some level of government financing, (c) jointly operated programs with industrial facilities and vocational systems staffing (or vice-versa) and other mixes of resources, (d) those programs operated primarily by the vocational education system with assistance from industry through loan of personnel or other resources, and (e) those operated totally by the vocational education systems.

The development of guidelines for program operation is an important step in the overall development of the vocational programs. This step awaits as its basic input the information from curriculum analysis on how much time, material and equipment is required for training in various vocational areas. With that information the unit must contact and develop relations with every major commercial, industrial, agricultural and other organization in the Korean economy to work out programs of cooperation using tax incentives, subsidies, legislation and appeals to corporate interests to establish procedures for optimal operation of programs.

Placement of Graduates

This basic function is important but requires little elaboration here. Procedures should be established within the vocational education system to take major responsibility for placement of its graduates. Through utilization of continuing information on employment patterns, on past and planned graduates, and on incentives and restrictions in agreements with cooperation industries and agencies, the vocational program should attempt to place as many of its graduates as possible. Success in placing graduates should be considered as partial feedback on the adequacy of the various programs and should be information constantly placed into the unit responsible for choosing vocational areas in which training is to be offered.

Evaluation of the Total Vocational Program

The program for vocational education that is being suggested requires a sophisticated and costly evaluation mechanism which currently does not exist. This evaluation mechanism must operate in both the formative and summative sense giving developmental research characteristics to the vocational program. The formative evaluation aspect must stress constant ongoing evaluation of the program within each unit and, in terms of all combined units, provide continuous information on the rate and nature of development of the vocational system. Summative evaluation must be applied to functions performed by various systems units and to the specific vocational programs which have been developed and operated. (See an extensive discussion of evaluation concepts in Chapter Six.)

As part of this evaluative effort, particular attention must be paid to the development of meaningful criteria against which the system and its various components may be evaluated. Basic to the evaluation will be information on placement of graduates and adequacy of performance in their vocational positions. Other indices must also be developed and might include:

-number of programs of various sizes

-amount of private (industrial, etc.) involvement

-breath of skills involved or represented in programs

-amount of potential or observed transfer of training within clusters

-rate of learning within programs

-availability of "enrichment" material within programs

-quality of staff in relation to functions they perform

-opinion, satisfactions, etc., expressed by students, employers and parents

-cost/benefit information.

This evaluative function must be considered as an integral part or operating unit within the vocational education system, contributing to the overall performance of the system and subject itself to constant formative evaluation. Without the evaluative control of quality of the program, decisions on the value of the program and its contributions will be difficult to make. The organizational arrangements for a proposed Office of Vocational Programs are shown in Figure 5-7. The interaction of the Office with the appropriate organizations in the Korean economy is through a general committee for program objectives which should presumably have subcommittees for each vocational cluster, such as agriculture, mechanics, electrical, etc. The important liaison with the general education system (through the Education Ministry) is carried out through a liaison section which would be responsible for monitoring and facilitating maximum appropriate interaction with the general education system. Divisions for programs matters are established on a functional basis and an operating group is established which would have sub-divisions, also possibly on a cluster basis.

Figure 5-8 shows the general sequence of procedures for development and evaluation of the vocational education programs.

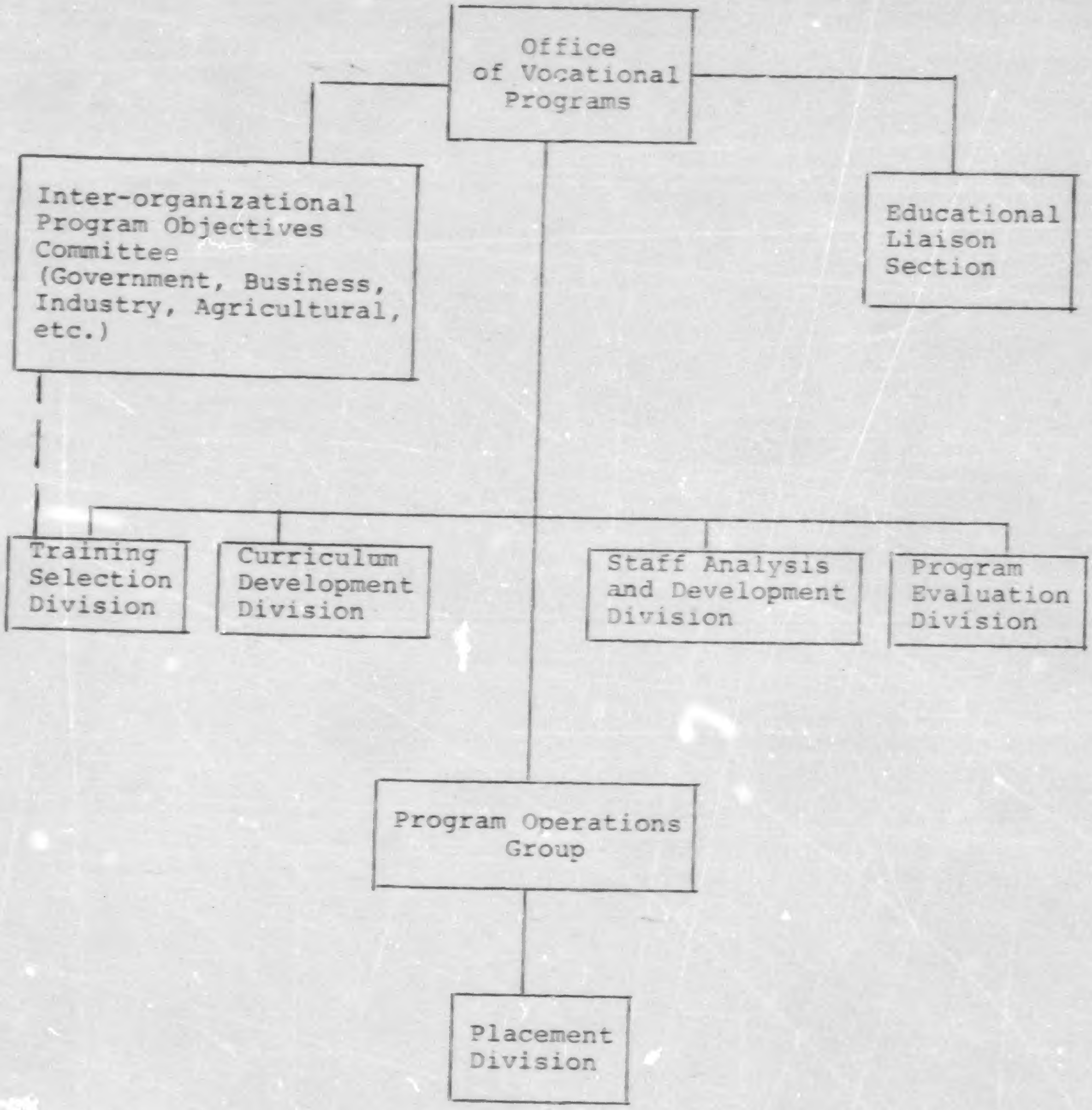
Office of Vocational Programs
Inter-organizational Program Objectives Committee (Government, Business, Industry, Agricultural, etc.)
Educational Liaison Section
Training Selection Division
Curriculum Development Division
Staff Analysis and Development Division
Program Evaluation Division
Program Operations Group
Placement Division

Figure 5-7. Suggested General Organization Chart for Centralized Control of Vocational Programs.

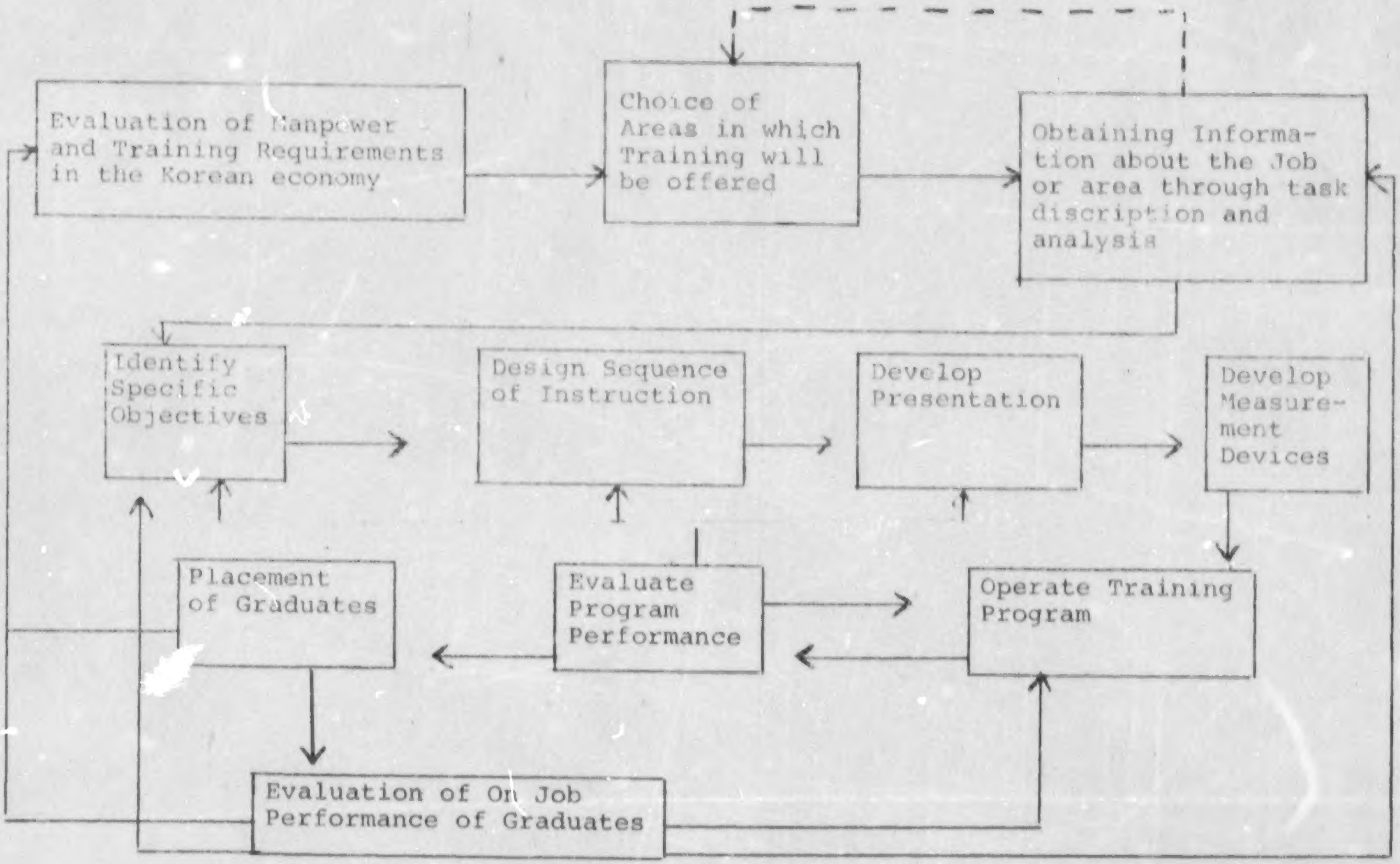
Evaluation of Manpower and Training Requirements in the Korean economy
Choice of Areas in which Training will be offered
Obtaining Information about the Job or area through task discription and analysis
Identify Specific Objectives
Design Sequence of Instruction
Develop Presentation
Develop Measurement Devices
Placement of Graduates
Evaluate Program Performance
Operate Training Program
Evaluation of On Job Performance of Graduates

Figure 5-8 General Characterization of the Vocational Education Program.

CHAPTER SIX

CONTINUOUS EDUCATIONAL EVALUATION AS A SUBSYSTEM[1]

This report has recommended the adoption by the Korean educational system of a series of far-reaching and important innovations in areas of information presentation, student assessment, staffing patterns and organizational structure. In order to optimize the adoption and effect of these innovations, it is necessary to develop an efficient appraisal and evaluation activity which will provide policymakers and the public in general with extensive information about the various achievements, changes, problem rectifications, etc., which are provided by these innovations. Under the best circumstances, this evaluative function will encompass the current educational system and its transition to the proposed educational system. Information within this evaluative function will be developed at both the student level, i.e., the performance of individual students and various groupings of students, and at the component level, i.e., the performance of the various educational components which comprise the innovative pattern being proposed in this report. Only by covering the range of information from the student to the component will the public and the decision makers be able to know how the Korean educational system is performing.

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1. This chapter was prepared by Garret R. Foster and Clifton B. Chadwick.

Within this chapter, an educational evaluational system for the Korean educational system will be proposed and discussed. The topic is divided into consideration of the role evaluation may play in general, evaluation at the national level, evaluation at a component level, evaluation at the school level, and evaluation at the student level. This chapter will put forth recommendations on development of evaluation at these levels; development of techniques, procedures and models for evaluation; and responsibilities in evaluation within the innovative model suggested in this report.

The Evaluation Concept

Ten years ago, educational evaluation techniques had relatively little to offer toward the formulation and evaluation of an educational program in a developing nation. Educational evaluation was a rather stagnant process of standardized testing, grading, placement, certification and accreditation which served to maintain normative standards of little known relevance to important educational outcomes or decision-making. The inadequacy of this evaluation system as a basis for program improvement first became apparent in the post-Sputnik period of curriculum development and educational innovation. The inappropriateness of standardized tests emphasizing recall of information as criteria for the evaluation of new programs designed to enhance problem-solving abilities became painfully apparent to educational innovators. School accreditation procedures of comparing a quantitative description of the educational process in a given school with a standard or "ideal" model became a major obstacle when one's purpose was to develop a new educational process or model in hopes of improving the educational outcomes.

Most recently, the economic squeeze on educational funds has revealed another major flaw in the evaluation component. As funds for education begin to shrink relative to increasing enrollments, educators, legislative bodies, and the public are becoming much more concerned with cost-effectiveness, cost benefits, and cost-utility approaches to educational planning and evaluation. The American educational system is just beginning to develop the budgeting procedures and the outcome measures necessary to implement such approaches as the Program Planning and Budgeting System (PPBS).

The pressures of educational change and the inadequacy of the established evaluation component to guide changes have resulted in an apparently productive partnership of educational innovators, educational researchers, and educational economists. Indeed, evaluation has recently become one of the most controversial, yet expansive, components of the educational system, and the nature of the transition has important implications for educational planning in developing nations. In brief, an evaluation program designed primarily to maintain the process standards of a relatively static educational process is being transformed to a system designed to facilitate the planning, development, and implementation of new educational systems and innovations as well as to provide the summative evaluations of operational programs in terms of costs and student performance. Thus, while the nature of the educational systems and innovations proposed for developing nations is likely to vary considerably, the evaluation models now evolving will be broadly structured to provide appropriate feedback at all stages from planning to operation. Although the vast majority of schools still operate under the traditional evaluation system, the broad design and

Major characteristics of the new evaluation component are already apparent in some school systems and in the publications of evaluation specialists.

Characteristics of the Educational Evaluation Subsystem

A definition of evaluation. Evaluation is a process of collecting information from many sources in order to formulate broadly based judgements of worth, informed recommendations for action, and sound decisions.

Purpose of evaluation. The purpose of evaluation is to improve education. It is necessary to state the obvious because evaluation designs have often precluded assistance in program development. Under the philosophy of the classical research paradigm, the evaluator would not permit the use of his data as a basis of major alteration in research design or treatment procedures for the duration of the experiment. Only in recent years has the concept of formative evaluation, designed to facilitate program development and student learning, begun to equal if not eclipse the role of summative evaluation which provides a judgement of the worth of the program after it has been implemented. The evolving evaluation paradigm recognizes that data for immediate and direct assistance to the educator and the learner, as well as data for judgements of worth, are essential to the improvement of education.

The scope of evaluation. The scope of formal evaluation has been greatly expanded in the past decade. Formal evaluation procedures traditionally have been applied to students, school personnel, school programs, and to components of school programs such as the curriculum. The decade of the sixties saw (1) a marked increase and strengthening of research and evaluation units at the district, state, regional and

[illegible]

national level, (2) the establishment of the National Assessment Program, and (3) the establishment of the International Association for the Evaluation of Education Achievement (IEA). Such efforts as these have significantly increased the number of evaluation designs, techniques and criteria available for application on a system-wide basis. Equally important, such efforts have identified certain deficiencies of current research methodology and stimulated methodologists to expand the theoretical and applied domains of research design, measurement and statistics.

The scope of evaluation has also been broadened in that the evolving system delineates a much more comprehensive role for evaluation within each level, ranging from the individual student to the national level. One of the more striking departures from the old evaluation system is the inclusion of program goals and objectives as entities subject to formal evaluation under the new system. To the evaluator, it is no longer acceptable to have the philosophy, goals and objectives of a national curriculum project determined solely by a project director or by a small clique of subject-matter specialists. To facilitate the development of a program without first ascertaining that the program objectives are consistent with the mission of the institution and responsive to the needs of the society it serves is totally inconsistent with the purpose of evaluation, which is to improve education. At the level of the individual learner, it is no longer assumed that all educational objectives are equally desirable for all children or that the selection of learner objectives should reside solely in the hands of adults. These have become matters of judgement and require some form of diagnostic evaluation of the individual learner's needs and abilities in terms of both present and potential program offerings.

The data base of evaluation. When education is conceptualized as an input-process-output model, the data base of the evaluation system may be described in terms of three corresponding sets of data. Input data consists of information about the resources, including student capabilities, that are to be utilized in the system; process data describe the ways in which these resources are allocated and organized as a means to an end; and output data indicate the extent to which the desired ends (student performance) are attained. In recent years, the movement toward output evaluation, or performance based evaluation, has gained considerable momentum. This represents a shift from the conventional norm-referenced evaluation to criterion-referenced evaluation. Under the norm-referenced system, the student (or school) is evaluated by comparison with his peers, a procedure which says little about what the student is or is not able to do as a consequence of his education. One could pursue the matter by looking at the norm-referenced test to see what a given student was able to do, but this would be of little help because standardized tests are not designed primarily to indicate what a student should be able to do. Criterion-referenced evaluation, on the other hand, involves the identification of criteria and standards on a functional basis, i.e., what a student needs to do and how well he needs to do it to succeed at the next instructional level or in post-instructional pursuits.

Criterion-referenced testing has become the cornerstone upon which the new evaluation system for Korea should be built. It is central to such concepts as continuous student progress through a hierarchically structured curriculum, national assessment of educational progress and school and instructional unit accountability. In continuous progress programs, criterion-referenced evaluation serves to insure that a student has attained those levels of mastery on one set of objectives necessary to progress to a higher level of objectives. This represents a marked departure from the present system, especially at the levels of secondary and higher education where evaluation consists primarily of midterm and final examinations for purposes of grading and promotion. Those who fail are recycled through the entire process under the same conditions and often with little hope of improvement.

The use of criterion-referenced testing at the national level makes it possible to measure educational progress by observing the levels of mastery attained by successive generations of students. A similar application of criterion-referenced testing is being made at state and local levels. The State Of Florida, for example, has recently established school accreditation procedures which hold schools responsible for demonstrating that students can perform on a variety of educational criteria against standards deemed reasonable by both local and state education officials.

While continuous progress programs, the National Assessment Program and school accreditation programs call for a new use of output or performance data in conjunction with functional standards, the concept of school accountability represents a new use of output data in conjunction with input and process data. Traditionally, input data have been related to process data for budgeting purposes, and output data have been related to process data for evaluation purposes. School accountability requires the linkage of input in terms of money to output in terms of student performance for alternative programs described by process data. In other words, educators are now being asked to account for funds spent on specific programs in terms of concrete evidence of benefits to the students. The purpose of accountability programs, beyond that of accounting for funds spent, is to establish relationships between costs and criteria for effectiveness, benefits and utility on which to base program planning and allocations of funds. Applications of existing techniques such as program planning and budgeting systems are now in progress and new systems which could have use in Korean education are being developed by Frank Banghart at the Florida State University (1969) and J. Alan Thomas at the University of Chicago (1967).

A Comprehensive Model for Program Evaluation

The comprehensiveness of the evolving evaluation system is best illustrated in the area of program evaluation. In the evaluation of innovative programs, it is important to recognize that the outcomes reflect not only on the innovation per se (e.g., team teaching, discovery method, etc.) but also on the logic of a specific model and the plan devised to implement that model, on the management under which that plan is executed, on the commitment of the power structure and personnel, and on the availability of necessary resources. A comprehensive evaluation of a developmental effort, therefore, would provide descriptive and diagnostic feedback at all levels:

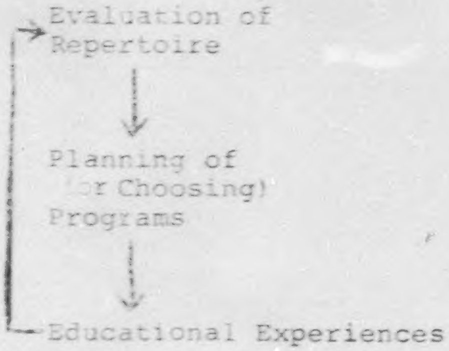
1. The Planning and Developmental Level
    a. Cost benefits and cost utility analysis in order to judge the consistency of estimated costs of alternative programs with the needs and values of the constituency.
    b. Strength of commitment at the policy, administrative and instructional levels.

   c. Adequacy of resources in relation to program goals.
   d. Internal consistency of the program model, i.e., consistency of goals, performance objectives, the instructional methods and media for attaining objectives, and the evaluation criteria.
   e. Operational feasibility of the plan for implementing the model.

2. The Implementation Level
   a. The progress of program implementation at the instructional level.
   b. The problems of program implementation.
   c. The deficiencies in the model or plan for implementation that give rise to the problems.
   d. Program effectiveness on performance data against minimal standards.
3. The Operational Level
   a. Program effectiveness on performance data against maximal standards.
   b. Documentation of side effects (positive and negative) of the program.
   c. Cost analyses in terms of effectiveness, benefits and utility as a basis for the decision to field test the new program for diffusion.
4. The Diffusion Level

   This represents a recycling of the above procedures (with appropriate modifications) for field testing on a representative sample of the target population.

This general model may be followed at the four levels under consideration with some changes at each level. The initial and basic level which provides the foundation for educational evaluation is the evaluation of the individual student. For each student it is necessary to ascertain the nature of his repertoire at any given milestone in his education. On the basis of that assessment and within the objectives established for or by the student, it is then possible to plan and/or develop or choose an experience or group of experiences which, when implemented, will bring the student to his objective. Upon termination of the experiences, re-evaluation of the student establishes whether or not he has attained the behaviors represented by the objectives. This type of evaluation should emphasize the formation of appropriate knowledges and skills within the student and should de-emphasize making judgements about the student's position in relation to other students. The emphasis should be on formation, not on grading. Evaluation, under these circumstances, provides feedback to the student, his teachers and his parents on what he is achieving and at what rate, so that he may be encouraged, assisted and facilitated in his attempts to meet the educational objectives. Diagramatically, this evaluation sequence is represented in the following figure:

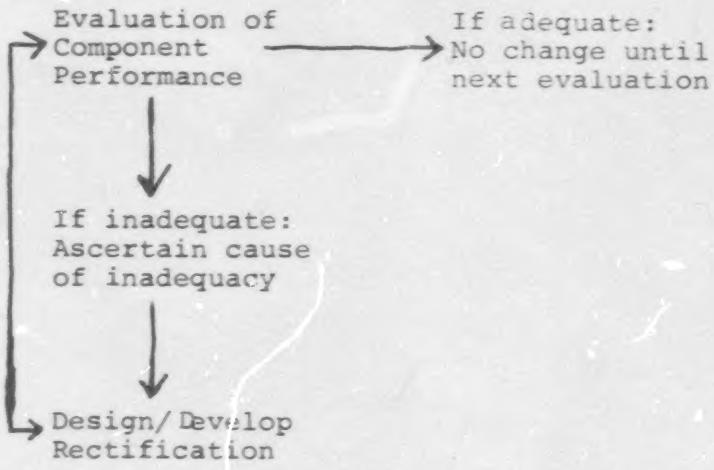


The more frequently the evaluation can occur the more it may contribute to the student's development. This simple figure can also be expanded to represent a large number of alternative forms of evaluation, development or educational engagement.

The next level of evaluation is the component level. Each contributing component,such as the various presentational components (educational TV, group instruction, individualized instruction), is evaluated to ascertain if its performance is meeting the objectives established for them. As an example, if a specific programmed instruction unit is expected to teach 100 specific knowledges to 90% of the students within 50 hours of instruction, the evaluative information is gathered on time, number of students and number of mastered skills. If time required is averaging more than 50 hours, if number of objectives mastered by 90% is less than 100, etc., the unit is re-examined to see what changes should be made in it. (The components will be discussed further.)

The school level is the next major level of evaluation within this model. Each school unit may gather evaluative information on the success of its students and the success of its components which combine to be the success of the school. At the school level, increased emphasis is given to the cost factors associated with the various components of success so that an optimal level can be achieved in terms of amount learned by students and costs for that amount.

Another important level of evaluation is the pattern of performance of various components across a large number of schools. This evaluation focuses not on the role of the component in a school, but the role of the component across a broad range of schools. Particular attention is paid to the variance of performance between various schools to ascertain what factors are operating which might allow a component to do better in one school than in another. If a programmed instruction unit is performing better in school A than in school B, the evaluator must attempt to delineate the possible explanatory factors which account for the difference, and when such factors are located must attempt to change the innovation in school B in the manner indicated by the factors. Diagrammatically, this process is similar to the one given for student evaluation.


Evaluation of Component Performance
If adequate: No change until next evaluation
If inadequate: Ascertain cause of inadequacy
Design/Develop Rectification

Again, emphasis should be placed on having evaluation occur as frequently as possible, or on a continuing basis, so that discrepancies may be discriminated as rapidly as possible.

The highest level of evaluation is total system evaluation on a national level. Data on all schools, components and students form the source for this evaluation. By carefully designed sampling procedures, the amount of data on various aspects of the system may be kept within workable limits, with only occasional requirement for all of the information on every variable. At this level the important variables are summations or composites of the variables used at lower levels of evaluation. Choice of variables, criteria to be reached, weighting of variables and related issues are important problems at this level and should be reflective of the various goal and objective statements available for the Korean system.

Throughout all levels of evaluation, careful emphasis must be placed on the purpose of the evaluative process and its results. The basic purpose is to provide adequate, valid and reliable information for the performers at each level so that they may achieve the highest level of performance possible under their constraints. The student wishes to achieve the highest level of performance consonant with his capabilities and the range of experiences available in the educational system. The school wishes to achieve the best performance possible for the largest number of students within the constraints of its resources. The variables chosen for these and other levels of system evaluation should be those which most accurately and efficiently reflect the achievement of the objectives at the level. Developing and choosing the appropriate variables is one of the major aspects of the evaluation function. The emphasis, then, is on evaluative information designed to facilitate the process of developing a maximally optimal, responsive and efficient educational system. A generalized figure showing the relations of the evaluative levels is included here. (See Figure 6-1.)

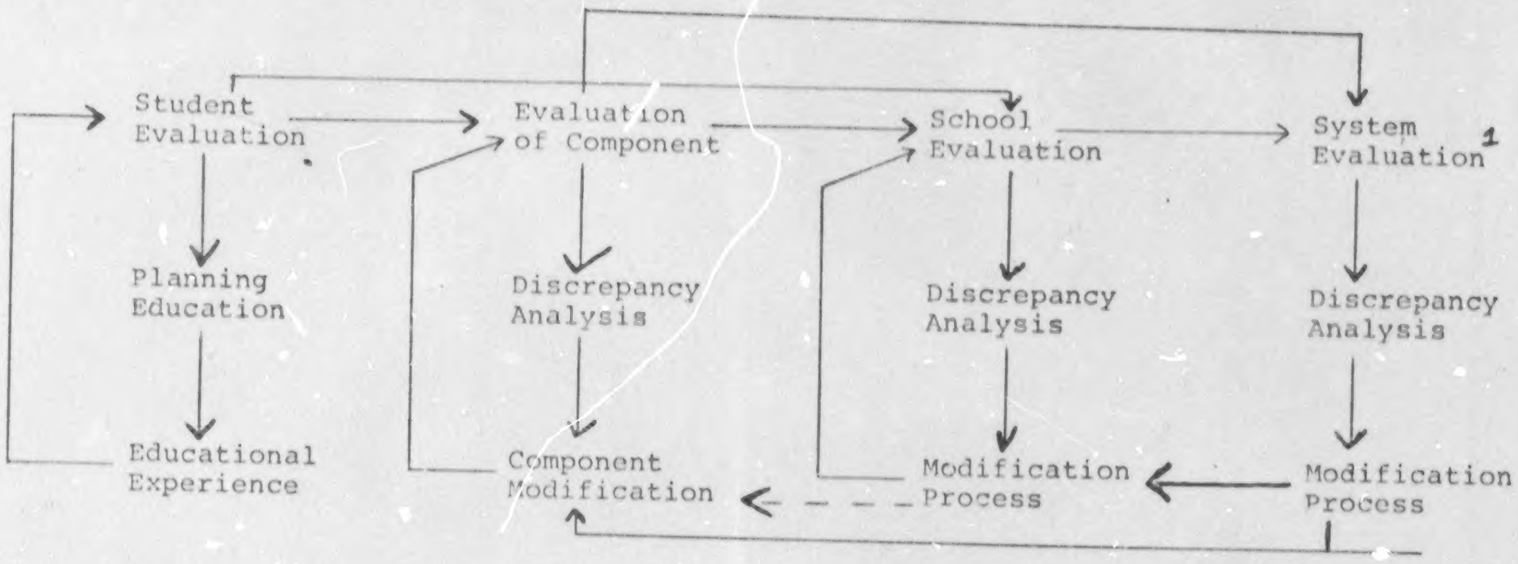

Student Evaluation
Evaluation of Component
School Evaluation
System Evaluation 1
Planning Education
Discrepancy Analysis
Discrepancy Analysis
Discrepancy Analysis
Educational Experience
Component Modification
Modification Process
Modification Process

Figure 6-1. A General Evaluation Model Emphasizing Information for Development.

1. Systems at regional, national or other levels--primarily the national assessment.

Development of the Evaluative System

To bring about the development of the broad evaluation system recommended here requires a series of activities which will be briefly described. The first of these activities is a thorough review of the nature and intent of the evaluative systems currently in operation in the Korean educational system. Very little information was available to the survey team concerning this topic, but the information which was available suggested the evaluative function is grossly underdeveloped. As a first step in the development of an evaluative system, it is necessary to expand these fragmentary findings to develop a more thorough characterization of the existing evaluation procedures and how they might or might not serve as building blocks in the new programs.

The second major activity is to extensively expand the evaluation model sketched here into a detailed design which is responsive to Korean education, to the innovations being implemented, and to the formative requirements of these. This activity includes developing and specifying variables and criteria for each level of the system. This is a large and important activity which will require some of the best available talent. It requires specifying the information which seems to be indicated/required by the goal statements of the system; the various organizations of the information into cohesive and related units, the manners in which the data might be collected, the personnel who might be responsible for collecting the data, the analysis mechanisms for the data, the decision points or control points at which the data should be used, the instruments which must be developed to collect the data, and many other items. Some general areas in which details must be developed are instrument, collection, analysis, decision-making, objective consistency and the various responsibility patterns. As a simple example of one portion of these activities at the student level, an outline of a data base for an individualized instructional system has been included at the end of this chapter.

Following the development of instruments, protocols, models, analysis techniques, etc., each must be submitted to a process of testing and validation. This activity must be done for the individual items and for the structural configurations of these items. On the basis of the tests, modification in items must be carried out and patterns reanalyzed in terms of the findings of the trials. This is an evaluative step for the evaluative procedures.

The design and development of an individualized program requires skills and talents beyond those normally found in the faculties to which the program is to be disseminated. Moreover, the nature of the program procedures and materials is inevitably influenced by other unique aspects of the school in which it was developed. Preliminary tryouts in selected schools provide for the identification and revision of factors which might limit or inhibit further dissemination. In addition to providing for further evaluation and revision of the new program, the field testing involves the development and evaluation of the orientation and inservice training procedures for implementing the new program in other schools. For these reasons, field testing for revision is an important final step prior to systemwide dissemination.

The next step is widespread implementation of the evaluative procedures. It is assumed that the breadth and complexity of the evaluation system being suggested here will require incremental implementation spread over an extensive period of time. The size of the system requires this approach, but the necessity of having an evaluative function in the early stages of the development of innovations for provision of formative information also requires the incremental approach.

The evaluation system which has been suggested in this chapter is a complex and important system without which the Korean educational system will be unable to ascertain the success of any systematic innovation. The emphasis of this evaluative system is on providing accurate and rapid information on the performance of the system at various levels in a manner which optimizes decision making for the continued formation and development of the system and the students within the system. This evaluation system would be able to bridge the transition between the current system and the proposed system and facilitate the progress through the transition. The system is intended to provide maximum responsiveness at all levels from student through nation.

EXAMPLE

Outline of a Data Base for an Individualized Instructional System*

I. Student Contract Performance
  - A. Number of assignments per weekly contract
  - B. Number of assignments completed per weekly contract
  - C. Criterion performance of completed assignments in a contract
  - D. Sequential order of assignment completion
  - E. Daily and weekly work pattern
  - F. Time to complete formal contract

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*From Foster (1970).

II. Contingency system

  A. Available reinforcers (list)

  B. Reinforcers used

  C. Reinforcement schedule used

  D. Who controls contingency system

III. Teacher contracts

  A. Date and time when contracts written

  B. Length of time to write contracts

  C. Skills sequence contracted relative to content scope and sequence

  D. Number of contracts written at one time

  E. Information used to write contract (examples: direct testing data, previous weeks contract performance, etc.)

  F. Locus of control (teacher alone, teacher and student, student alone)

IV. Materials

  A. Number of materials available in school in each content area

  B. Number of materials available schoolwide in skills within each content area

  C. Number of materials used in each weekly contract

  D. Levels of materials used in each weekly contract

V. Contract checkers

  A. Checker classification (teacher, student on own material, student on other student contract, non-professional personnel)

  B. Date and time when material checked

  C. Evaluation of checkers

  D. Number of checkers

VI. Special instructional aide

  A. Identification of aide

  B. Date and time of contract

  - C. Degree of control of contract (specified area)
  - D. Purpose of contract (work on specific skill, general assistance etc.)
  - E. Type of contract (individual and/or small group)
  - F. Evaluation of aides
  - G. Number of aides

VII. Informal testing

  - A. General academic level of student in content area
  - B. Specific skills in a content area (a detailed description of Language Arts testing is presented in Appendix B).

VIII. Formal testing

  - A. Group achievement across content areas
  - B. Group aptitude (intelligence)
  - C. Group personality
  - D. Individual achievement
  - E. Individual aptitude (intelligence)
  - F. Individual diagnostic
  - G. Individual personality

The data outlined above would be, for the most part, a byproduct of the individualized instructional process requiring little more than systematic record keeping in connection with student contracts or instructional projects. Data concerning classroom management would require the use of trained observers.

Observation Schedules--A number of observation schedules exist from which to choose or one could be developed around the following aspects of classroom instruction:

I. Observations of teacher behaviors

  - A. Teacher's use of social and academic approval

B. Teacher's use of social and academic disapproval

C. Social and academic approval and disapproval errors of reinforcement

D. Teacher movement in classroom

E. Directions

F. Questions

G. Classroom rules

H. Relative time spent on instructional activities

I. Observer classification (teacher, administrator, other)

II. Observation of student behaviors

A. On task/off task

B. Classes of inappropriate academic and social behaviors

C. Classes of appropriate academic and social behaviors

Survey data--Three types of surveys of judgements and opinions of project personnel are suggested for review purposes during the implementation phase. The first would be a problem survey asking school personnel to list the problems they are having at the implementation stage. In terms of formative evaluation, this is crucial information--it becomes useful, however, only when incorporated (1) into the decision-making process of the immediate effort and (2) into the dissemination efforts elsewhere.

In order to maintain an objective balance in the evaluation program, unanticipated benefits as well as problems resulting from changes in the program should be documented. A second survey, therefore, would be necessary to document the beneficial side effects of the new program.

The third survey would be a progress survey asking for judgements on the extent of satisfactory implementation of the planned innovations.

In brief, this amounts to a series of status studies during the implemention stage which should reveal important changes in the instructional process, organizational pattern, personnel utilization, etc.

These surveys would be continued during the transitional phase for the purposes of documenting and facilitating program implementation. At that point in time when the planned innovations are in effect and the new program has stabilized, the evaluation emphasis will shift from formative to summative, and evidence of program effectiveness becomes the primary concern.

CHAPTER SEVEN

DEVELOPMENT AND IMPLEMENTATION REQUIREMENTS

The educational program proposed for the Korean elementary and middle schools is clearly a dramatic change from the present Korean system. A decision by the Korean government to undertake so sweeping a reform of its basic educational program will trigger a host of other necessary decisions and actions. The effort required will be large and even in the development phases will impinge upon and effect many other institutions and agencies and indeed will ultimately touch the lives of all the nation's citizens. The plan presented by the study team is one which it feels can be developed by Korean educators and with Korean resources. The historical evidence of Korean energy, hard work and creativity fully justify this optimism. Even so, the conditions for assuring that the program will be brought to fruition must be met.

People, money and time are required. Most important, however, is the need for an organization which will permit the most effective utilization of these resources. The organization should be given the mission of building a new elementary-middle school program. Along with this responsibility it should be provided with adequate resources and authority to discharge this mission. Screven and others have pointed up the need for an agency to provide support to Korean schools in the applications of innovation, research and technology to the improvement of their instructional programs (Screven, 1970). Screven referred to the agency proposed by him as the "Korean Institute of Educational Technology" and he has outlined many valuable functions it could serve.

The Korean Educational Development Laboratory

The study team proposes that the Korean government charter an educational development organization whose primary function will be planned and systematic educational reform through a program of developmental research. To avoid confusion with the more service oriented agencies proposed by earlier consultants, the study team will refer to the proposed organization as the Korean Educational Development Laboratory (KEDL). KEDL will have functions which will appear to overlap those of several existing Korean agencies such as MOE's Textbook Compilation Bureau, the Audiovisual Institute, the Central Educational Research Institute and others. These existing agencies are presently performing important functions in Korean education. KEDL will not serve the purposes of these agencies; nor is it likely they could do the kinds of things that will need to be done by KEDL.

KEDL will need to have a clear and strong governmental mandate if it is to carry out its mission. It probably should have some characteristics similar to those of KIST on personnel matters, research independence and organizational autonomy. On the other hand, it should be an integral part of the Ministry of Education with KEDL's director responsible directly to the Minister. Administratively it ought to be separated from the other operating Bureaus of MOE or it will become involved in the large, day-to-day problems with which these other bureaus deal. The placement of the Office of Labour Affairs within the Ministry of Health and Social Affairs might bear study to determine whether that organizational relationship might serve as a model for KEDL's placement in MOE.

The development funds described in the next chapter would essentially be the operating budget for KEDL with the Laboratory using these funds for continuing planning, the development and miniature try-outs of the components of the new program, and finally, the assembly of the components in schools for a field-test of the completed program.

Figure 7-1 shows a way in which the functions of KEDL might be organized. The functions are divided into (a) the instructional system, (b) the support system and (c) the management system. These three categories of activity are broad enough to include the kinds of things KEDL will need to do in the future. It is important to note that these sub-organizations within KEDL must have an intimate working relationship with one another. Compartmentalization and rigid territorial boundaries which tend to occur with time in any organizational structure should be guarded against.

A most important condition which must be met before undertaking an effort as intricate and complex as the one envisioned is the development of detailed activity plans--detailed blueprints for actions. These become the system management plans that will govern the conduct of the overall project. These plans will describe specific activities that must be done; assign responsibility for particular jobs; describe time, manpower and money requirements for completion of the job; place each job in the context of the total activity (What must be completed before this job is undertaken,and what subsequent activities will need or depend upon the products of this job?); and identify key checkpoints or milestones within the total job so it can be quickly determined if the job gets off schedule.

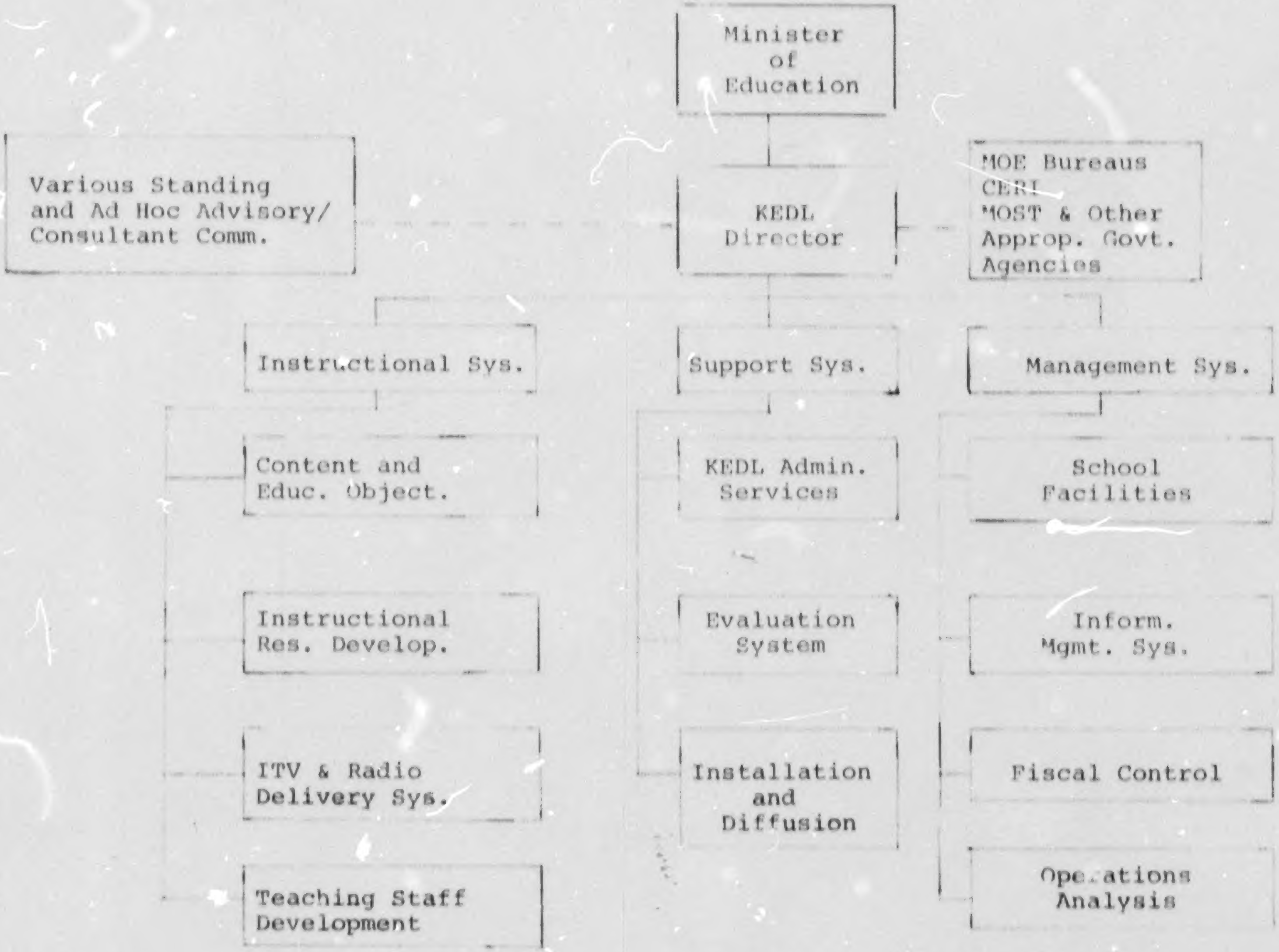

Minister of Education
KEDL Director
Various Standing and Ad Hoc Advisory/ Consultant Comm.
MOE Bureaus
CERI
MOST & Other Approp. Govt. Agencies
Instructional Sys.
Support Sys.
Management Sys.
Content and Educ. Object.
Instructional Res. Develop.
ITV & Radio Delivery Sys.
Teaching Staff Development
KEDL Admin. Services
Evaluation System
Installation and Diffusion
School Facilities
Inform. Mgmt. Sys.
Fiscal Control
Operations Analysis

Figure 7-1. An Organization of Functional Activities of the Korean Educational Development Laboratory.

Program Evaluation Review Technique (PERT), GANTT charting, and critical path analysis are all basic management tools with which Koreans are familiar and which will be essential in the planning phase and the later management of the project. The plans will also reveal what types and levels of personnel will be required at what period in the project. Since some specialists will be needed for one phase of the effort and not others, personnel policies and salaries should permit and, indeed, encourage the movement of professional staff into and out of KEDL as they are needed. These people could come from the universities, other government agencies and the private sector, returning to their home organization when their particular contribution had been made. Normal civil service procedures militate against this flexible utilization of human resources and should be waived for KEDL if at all possible.

The selection of the Director of KEDL will perhaps be the most crucial decision of the total project. The Directorate calls for a man of extraordinary management ability as well as one who can command the respect and loyalty of the small but intellectually powerful group of Korean educational research leaders. The capacity to attract and retain Korean's ablest researchers, to energize them and to orchestrate their capabilities into an efficient and coherent production effort is a must. Korea is fortunate to have such men. The study team suggests that the Minister of Education appoint a search committee whose members are drawn from government, industry, public education and educational research to identify candidates for the Director's position.

Once the Director is appointed he will recruit the nucleus of KEDL's senior staff. This group,working with ad hoc Korean advisory committees and consultants, will begin the detailed planning effort described previously. The study team estimates this planning effort will take approximately ten man years of effort and can be completed in one calendar year.

General Considerations for Development and Implementation

The educational program proposed by the study team will require an extensive development effort and the largest share of KEDL's budget will be allocated to development. New programs and products will be required with the introduction of individualized instruction, student learning units, instructional radio and television, and differentiated staffing. The study team doesn't feel that it would be appropriate nor possible for it to provide a "cookbook" that would cover all of the development requirements. There are several references which can partially serve this purpose and which will have much value for the KEDL staff. These cover such topics as: how to define instructional objectives; how to build programs of instruction; procedures for the design of multi-media instruction; developing individualized instructional materials and many more (Briggs, et. al., 1967; Briggs, 1968; Briggs, 1970; Johnson and Johnson, 1970; Edling, 1970; Popham and Baker, 1970; Gagné, 1970)

In this section of the report discussion will focus on the general aspects associated with the development of educational materials, television systems, personnel patterns, and management and administration systems.

The Selection, Development and Use of Instructional Media

When considering the implications of using the systems approach and a variety of instructional resources to implement educational technology within the educational process, it is convenient to think in terms of a simple input/output model for the learner. From this simplified input/output model, individualization of learning can be thought of as a process by which the student maximizes his informational input, mental processing, memory storage and response output. In psychological terms this conception of learning behavior is specified by the stimulus array, the cognitive processes and the response requirement. Breaking the behavioral processes of learning into these three components will bring into focus the potential of educational technology and its associated techniques for curriculum development.

Characteristics of Input to the Student

In regard to stimulus input, investigators such as Briggs and Gagné have found that greater learning gains can be achieved by appropriate assignment of instructional media. Matching appropriate films, audio-taped lectures, or printed material to the type of learning has led to more systematic, positive learning results. These findings seem to be based on the fact that, although important forms of instructional stimuli, the spoken word and the printed word may not be the most effective or economical teaching stimuli for many kinds of performance objectives. It is important to note that various kinds of performance objectives represent different kinds of learning, and each type of learning may be best attained through the use of a particular instructional presentation. Various media are of differential effectiveness depending on the exact learning requirements imposed by the performance objectives. Since there is sufficient knowledge of the condition of these kinds of learning, the use of multimedia can result in improved motivation and resulting effective instruction.

In utilizing the input/output model to assist in the selection of appropriate media, multi-sensory input channels should be optimized. In considering both the acquisition of new knowledge as well as intellectual problem-solving skills, the information source should initially be focused within restricted sensory channels. In attempting to build problem-solving skills for long-term retention, the use of feedback and correctional media within the instructional interaction should be maximized as possible. When faced with evaluational decision making, especially in determining the successful attainment of performance objectives, a student's performance may be utilized in determining the appropriate decision about the criterion performance. And finally, the ease or difficulty with which the student moves from one medium or media device to another must be considered. While interruptions may break the monotony of the instructional processes, it has been found that interruptions within the presentation can interfere with acquisition and retention. Thus, the approach within educational technology stresses an appropriate matching of media to learning objectives in order to facilitate a smooth flow through each instructional session and to maximize the learning performance of the student.

Information Processing

In regard to the middle component in the model, pertaining to mental processing and storage, the manipulation of levels of difficulty of the learning material has proven to be an important variable. Consistent findings at Florida State University as well as at Stanford have indicated that an optimal matching of the level of difficulty of the learning materials to the student's performance level leads to improved mental processing and enhances long-term retention. Thus, the utilization of such methodological techniques as readability formulas and analysis of the complexity and sequential structure of the solution algorithms found within educational problems in mathematics can lead to better curriculum construction. Finally, the provision for practice and spaced reviews to foster long-term retention has come to be considered an essential ingredient. In turn, these have direct implications for the proper employment of multi-media presentations and for the optimum sequencing of learning materials.

The Response

Turning to the response side of the model, it is recognized as important to match the performance requirements specified within the behavioral objective to that of the actual conditions of both practice and evaluation. By systematic planning for mixing alternative kinds of styles of response modalities, not only is retention improved but the student is more highly motivated to fulfill the assigned practice requirements.

Developing Learning Materials

The first and perhaps major consideration in developing learning materials based upon educational technological principles is concerned with the assembling of a multi-disciplinary team of scholars, representing a functional organization with differentiated roles and related competencies. There should be chosen from within the Korean system a sufficient number of competent scholars who can relate the structure of the learning material to the Korean culture and its associated values. These scholars should undertake the task of making a detailed analysis of the learning structures and matching them with appropriate conceptual sequences, that is with those that are most consistent with the style and type of behaviors likely to be found in the student population.

Second, there is a requirement for behavioral scientists who can provide the leadership for implementing behavioral methodological techniques. Having a sound understanding of learning principles and processes, these behavioral scientists can provide a clear understanding of how to appropriately implement task analyses, behavioral objectives, and instructional strategies.

In most cases, it has been found helpful to have professional writers who can assist in developing more effective communications with the students. Next, there is a requirement for media specialists, particularly television specialists, who not only can assist in the selection and matching of appropriate media with the behavioral requirements of the learning task but also can help in the technological intricacies of developing the instructional programs. In addition, the process involves participation of representatives of the teaching staff who will be implementing the materials. A good understanding of the characteristics of the instructional staff will provide for a smoother field study and dissemination process. Finally, there is a requirement for evaluators who can help in the recycling process essential within field studies for revisions of the learning materials. The selection of specialists to form these interdisciplinary teams is probably the most important prerequisite to the application of modern educational technology.

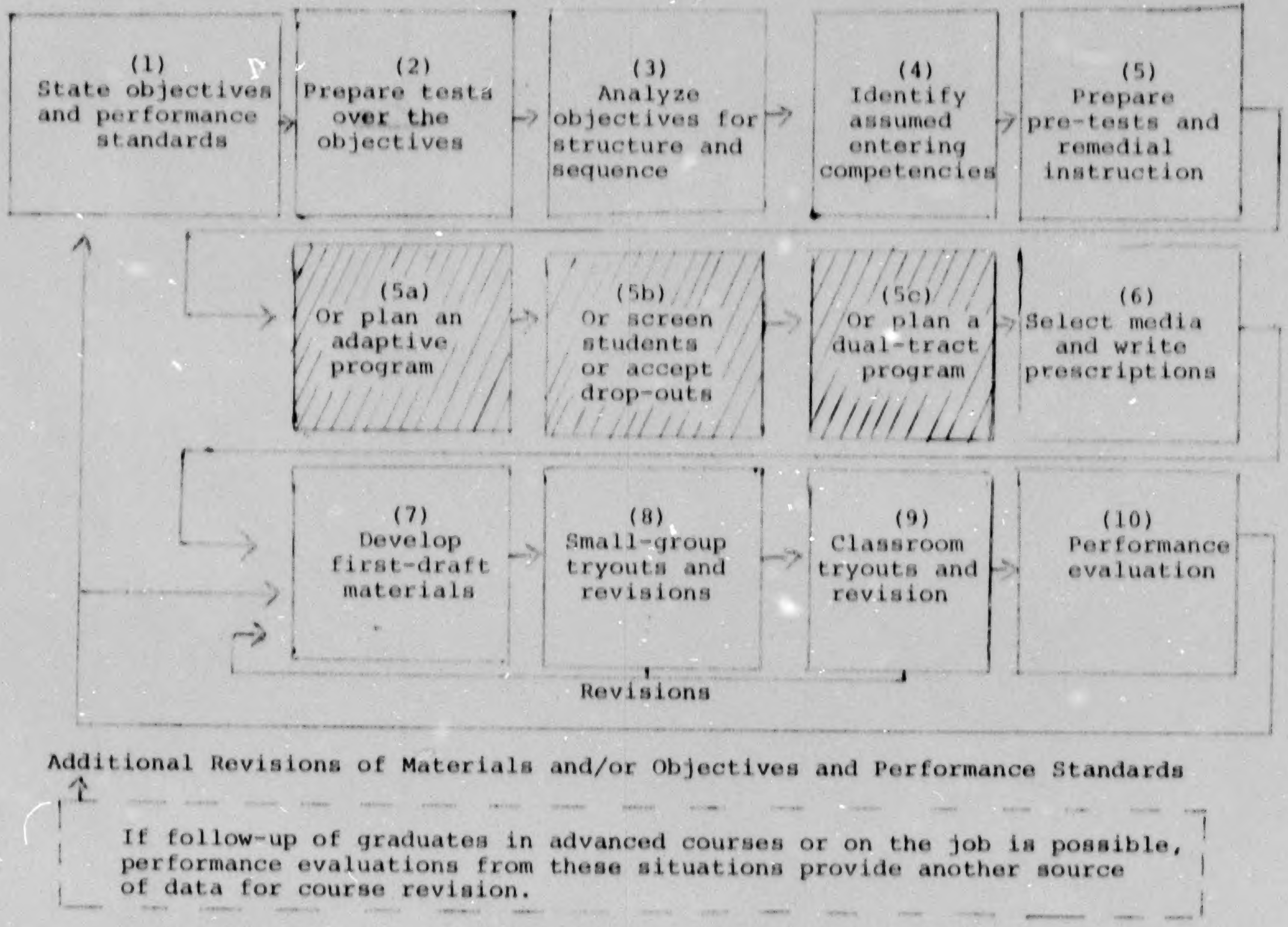
The employment of development techniques such as systems analysis and project management techniques, such as Program Evaluation and Review Techniques (PERT), can facilitate the development of a learning materials project. The use of project planning, flow charts and milestone analysis will assist in assuring that projects are completed within a realistic time schedule with appropriate and effective outcomes. Sound management techniques can vastly increase the rate of development of learning materials, their dissemination throughout the educational system, and also provide for significant cost savings.

The development of the individualized instruction modules and the educational television presentations have several features in common, as well as several details of production which differ. The following section suggests the format to be followed in both cases, followed by discussion of specific approaches for the separate media.

Figure 7-2 describes the general steps for the development of instructional materials or presentations for the classroom. Step one has been discussed in earlier sections, but prior to design of instructional sequences it is necessary to ascertain if the objectives are stated in the appropriate fashion. The second step emphasizes the terminal behavior, asking the materials designer to focus on what it is that the student or students will be able to do at the completion of the unit and to prepare the criterion-referenced measurement items which will be used to find out if the student can demonstrate the required performance.

The objectives which are being sought are then subjected to analysis for placement in an optimal sequence (Step Three). It is

Figure 7-2. Flow Chart: A Model for the Design of Instruction. (Briggs, 1970)


(1) State objectives and performance standards
(2) Prepare tests over the objectives
(3) Analyze objectives for structure and sequence
(4) Identify assumed entering competencies
(5) Prepare pre-tests and remedial instruction
(5a) Or plan an adaptive program
(5b) Or screen students or accept drop-outs
(5c) Or plan a dual-tract program
(6) Select media and write prescriptions
(7) Develop first-draft materials
(8) Small-group tryouts and revisions
(9) Classroom tryouts and revision
(10) Performance evaluation
Revisions
Additional Revisions of Materials and/or Objectives and Performance Standards

If follow-up of graduates in advanced courses or on the job is possible, performance evaluations from these situations provide another source of data for course revision.

suggested that a procedure or hierarchy such as the one developed by Gagné (1970) and discussed by Briggs (1970) be used in this analysis.

Steps Five and Six of Figure 7-2 are critical ones in terms of the Korean project. In order to select appropriate media/curriculum interactions, it is appropriate to review the characteristics of the media being suggested in this report. The primary media suggested for the Korean model are instructional television (ITV), self-instructional materials and lectures. Secondary presentation forms include discussions between students, laboratory exercises and conferences with teachers.

The self-instructional module, an extension of programmed instruction, is defined as a systematically designed and validated program of learning experiences, in this case presented as printed matter. The stimuli presented are printed words, drawings or stationary pictures, arranged in relatively small segments of information interspersed with requirements for responses on the part of the student. The size of presentation units will tend to vary as a function of the curriculum, but it is hoped that the units will be of a length that can be completed in small steps spaced over a few hours time. After each unit of instruction, a criterion test of performance will be given. These units should be designed to provide generalizing experiences with a reasonable number of examples. Various examples of these units may be found ranging from programmed instruction texts (Espich and Williams, 1967; Lumsdaine & Glaser, 1960; Glaser, 1965; Lange, 1967) to generally organized units requiring less frequent responses such as Learning Activity Packages used at the Nova School (Wolfe and Smith, 1968; McNeil, 1968) or the Teaching-Learning Units used in Project PLAN (Flanagan, 1968). It is suggested that the Korean system develop packages like these latter.

Self-instruction or programmed instruction has as its strengths that it has a self-paced rate of presentation, is designed around performance objectives, provides frequent knowledge of results, has active learner participation and low error rate, and usually leads to high retention and progressive achievement. It also has the strong feature of not needing much teacher time. Well organized self-instructional programs allow the teacher to engage in other activities, such as tutoring or counselling students who are having difficulties (Flynn and Chadwick, 1970). The main problem with self-instructional materials is that they are difficult to produce, take many hours to produce units, require highly trained individuals in the production process, and are not always responsive to the more rapid learners in classes.

Lectures

This extensively used, much maligned medium has not been the subject of nearly as much empirical study as has ETV or programmed instruction. According to Ausubel (1963),the amount of material learned from lectures depends heavily on the listener's ability to incorporate the main ideas of the lecture into his personal "cognitive structure." Except for characteristics such as techniques to add emphasis, to show relatedness, to provide contiguity and redundancy, and the like, perhaps Ausubel's most concrete suggestion for improving lectures is to use "advance organizers," brief, introductory remarks which summarize the content to follow in the most general form as an aid for forming cognitive structure. Lectures, like other media, can be improved by requiring explicit student responding, with immediate knowledge of results. Explicit response is student response to definite questions purposefully posed. Frequently, the use of outline handouts, printed questions, etc., will help to structure lectures (Briggs, 1970).

Lectures present ideas and facts rapidly, allow emphasis to be placed where the teacher wants it,are excellent for giving background material, can be modified to fit specific questions asked by students, and can be presented to fairly large groups. It is difficult to adjust lectures to individual speeds of comprehension; learners do not participate much in lectures; it is difficult to obtain a direct check on the amount of learning taking place. Lectures can be improved by dynamism in the lecturer, use of audiovisual supports, frequent asking of questions (even if only rhetorical),and the use of outlines and other "handout" materials.

Instructional Television

The effective use of educational or instructional television requires a careful analysis of the characteristics of the medium. Papers by Chu & Schram (1968), Allen (1969), Tosti & Ball (1969), and others have described the instructional characteristics of television. It is a pictoral medium where stimuli are presented in verbal and/or pictoral form, requiring only correct responses from students during presentation, with a short duration (duration of stimuli is always for present only) and subsequent presentation of stimuli is not contingent upon any student performance (Tosti & Ball, 1969).

Television appears to be most effective in teaching principles, concepts and rules when it illustrates them with examples and it is also effective in teaching factual information, visual identifications, and procedures, and in developing desirable attitudes, opinions and motivations (Allen, 1969). Television is also capable of performing the general instructional functions of presenting the stimulus, directing attention, providing a model of expected performance, furnishing external prompts and guiding thinking (Allen, 1969). The medium is not an effective device for providing feedback, particularly to individual students, nor is it effective in performance assessment. It has many of the strengths associated with lecturing, with demonstrations and, of course, motion pictures. Its primary weaknesses are also similar to those of lectures and motion pictures. It is not learner-paced and, in general, it provides no convenient way to measure performance of the students, although it can be used to present standardized tests to groups of students.

Table 7-1 gives a general comparison of the features of the three primary media for the Korean model. In general, the strengths and weaknesses of the three balance in a manner which makes their careful combination a useful approach.

After the decision has been made concerning the optimal medium for the specific set of objectives, the materials must be prepared and tested as suggested in Steps Seven and Eight. Emphasis is placed on the careful, programmed development of the educational sequences regardless of the medium chosen. In other words, if the medium chosen is ITV, the developers must still take the steps to insure that the instructional sequence is arranged in the appropriate manner and should not be satisfied with simply taping a "lecture" on the sequence. The testing or validation aspects (Steps Eight and Nine) should receive considerable emphasis as validation at an early stage will save problems and expensive or extensive re-validation after widespread adoption of materials or programs.

Table 7-1. A Comparison of Features of Three Media.

Features / Media	TV	LECTURE	STUDENT LEARNING UNITS
Presentation	large group	large or medium group	individual
Visual	yes	yes	yes
Audible	yes	yes	yes (with radio)
Learner-Paced	no	no	yes
Learner Response Required	no	partially	yes
Fixed Sequence	yes	generally	can branch
Repeatability	complete	limited	complete
Affective Possibilities	yes	yes	yes
Ease of Transmission	complex	simple	simple
Controlability	high	low	high

A reexamination of the flow chart (Figure 7-2) as applied to the Korean situation shows emphasis should be placed on the following points:

1. Clarification and specification of objectives and performance to be required from the student
2. Adequate preparation of measurement devices
3. Analysis of optimal medium for presentation within existing system constraints
4. Iterative development and testing of materials or presentation
5. Consistent, thorough evaluation of student learning and materials/presentation performance.

Instructional Television System

Delivery systems with proven performance, ranging from printed materials to sophisticated multi-purpose telecommunications grids and computer networks, can accomodate and support a wide range of educational tasks in many different environments. No one system is ideal in that it can be readily available for all audiences, be scheduled on demand, offer ready access to information sources, provide immediate response, and be economically feasible. Educational television has a primary advantage in its ability to deliver mass-scale programs at relatively low costs per pupil. Because of its flexibility and general appeal, it is able to enhance concepts of national unity. Television, particularly when mixed with other media, presents new opportunities for instructional strategies planning individualized, team, and mass instruction. One does not plan a television system but an innovative instructional system making optimum use of television.

In the development stage, it will be necessary to focus on two distinct aspects of the educational television system: the mechanics, mechanisms, or hardware that comprise the television delivery system, and the content, message or "software" that are delivered by the system. This discussion will focus on the hardware aspects. Discussion of the software aspects is found in the preceding section of materials development. This discussion will begin with a brief review of current television broadcasting facilities in Korea.

Korea's initial endeavor into broadcasting came on February 16, 1927. The Korean Broadcasting system went on the air with a power output of one kilowatt with the call sign JODK, on the 345 meter band.

Before Korea was liberated from Japanese rule in 1945, the Japanese had controlled the broadcasting system. After liberation, the newly established Korean government took over the broadcasting facilities. Thus, in 1948, when the Republic of Korea was proclaimed, the former Chosen Broadcasting Corporation, together with its nine regional stations, was transferred to the government.

Until 1954, the Korean Broadcasting System,with a central radio station in Seoul and various regional stations,was the only radio service in Korea. It was in that year that a non-government religious station began to operate in Seoul.

The first government-operated television station was inaugurated on December 31, 1961. Using the call sign HLCK, KBS-TV, the station went into operation with a visual power of two kilowatts, an audio power of one kilowatt, and 525 horizontal lines.

The Nanyang Transmitting Station, with an output of 500 kilowatts, the call sign HLCA, and a wave length of 970 kilocycles, went into operation on September 10, 1967.

Following a reorganization of the Korean Broadcasting System, on August 1, 1968, the Seoul Central Broadcasting Station, the Voice of Free Korea and the KBS-TV were integrated into one station under the name of the Central Broadcasting Station.

Korea's first educational TV programs were aired at the same time KBS-TV ceased sponsoring commercial advertisements on May 1, 1969.

Character and Policy of KBS

The Korean Broadcasting System is the nationwide radio and television network operated by the government of the Republic of Korea. Its operation is under the direct supervision of the Ministry of Culture and Information.

The Broadcasting System is supported from two major sources:

1. The national budget;
2. Subscription fees paid by set owners.

As a government operated station, the KBS serves the purpose of informing the people of government policies and work for public welfare. It attempts to meet public demand for specific types of programs with the ultimate goal of improving its programs to raise the educational level of the Korean people through its nation-wide network.

Utilizing multi-station microwave relay network, KBS will soon be reaching every home and school throughout all of Korea.

The Korean Broadcasting System is accomplishing its objectives in the following manner:

1. The Central Broadcasting Station, the key station of KBS, conducts simultaneous broadcasting over the country, while regional stations are actively serving the interests and demands of various regional communities.
2. The Korean Broadcasting System presents both general public interest programs as general information, culture and entertainment and specific group interest programs covering educational culture.

3. Educational broadcast (school) and farm and fishery programs are continuously broadcasted.
4. The Korean Broadcasting System is responsible in such matters as the reflection of national development, information regarding government policies, the raising of the morale of Korean Armed Forces, and the firm inculcation of democratic principles.
5. The Korean Broadcasting System continually attempts to improve its programming to encourage cultural activities and promote the welfare of the people.

Through these and other activties, the Korean Broadcasting System is making every effort to become one of the world's leading broadcasting stations. It is important to note that foremost in its policies, procedures and operations is the consideration for a better informed, more highly educated audience.

Programming

KBS-TV broadcasts six major types of programs daily. The scope of programs ranges from entertainment and recreation to newscasts and education. Table 7-2,presents the breakdown of the types of programs in minutes and percentage.

As shown in Table 7-2,nine percent of the scheduled program time is devoted to education. Considering the recent addition of this type of programming to KBS-TV, this is a relatively sizeable figure. KBS personnel have hopes for expanding this amount as soon as additional air time becomes available.

It should also be emphasized that, up until now, relatively few schools have installed TV sets for KBS-TV school broadcasts. More and

Table 7-2. Classification of KBS Programming.

Classification	Weekly Broadcasting Time (minutes)	Percentage
1. Newscasts	600	17%
2. Cultural programs for children and housewives	450	13%
3. General Cultural	1,290	37%
4. Entertainment and Recreation	540	15%
5. Education	300	9%
6. Others	335	9%
Total	3,515	100%

more schools, however, are expressing interest in the ETV programs and thus are installing sets. According to a recent report from the Minister of Education, primary and middle schools throughout the country share approximately 2,000 television sets. The MOE has laid down a five year plan for supplying sets to suffice the needs of all schools throughout the country in order that every school child can participate in the ETV experience.

The programs of KBS-TV are directed at the following grades: (1) primary school -- grades 4, 5, and 6; and (2) middle schools -- grades 1, 2 and 3. Five to six hours of educational programs reach these levels each week, Monday through Saturday. All programs are twenty minutes in length and include subject matter areas such as Social Science, Natural Science, Music and Fine Arts, etc. It is important to note that these programs are supplementary to the regular class work, are given as enrichment, and are not an integral part of the curriculum.

The Education Department of KBS is made up of various committees that design, implement and evaluate the broadcasts; the major committees are:

a. School Broadcast Committee

b. Planning Committee for school broadcasting programs

c. Seven subcommittees(for each subject).

These groups also have the responsibility for preparing a monthly teacher's guide book to be used in conjunction with the ETV broadcasts. The purpose of these manuals is to prepare and inform the teachers for pre and post programs activities.

The study team explored the possibility of developing the Korean instructional television network by means of "piggy-backing" on the need check out

commercial system already in place in the country. While many economies can doubtless result, it appears that a parallel but separate system will be required. The number of channels and required hours to meet the proposed educational needs could not be absorbed by the present system. The primary requirement is the addition of three microwave channels, development of production and transmission facilities, and the acquisition of sufficient receivers for the schools. Because of the design engineering already done for the present national television system, this part of the project will not be conceptually difficult, nor will it be too expensive.

Required Equipment

One of the key concerns and considerations of a television system is the type and quality of equipment utilized in the construction and delivery of the programs. Three types of equipment are necessary: (1) origination facilities; (2) reception facilities; and (3) transmission or distribution facilities.

1. Origination Facilities. It will be necessary to construct or prepare adequate facilities and equipment for production and origination of the TV programs. The equipment includes both audio and visual systems. The video system must include the camera, chains, mounts, lenses, remote control, switching systems, and monitoring systems. It would also include the video tape recording equipment, opaque, film, slide projection equipment, and control and distribution equipment.

The audio system includes microphones and the control and distribution equipment associated with the image audio. It would also include the intercommunications system between television control and reception points.

It is anticipated that an extensive review and analysis of existing facilities will be completed and that demands for the new system will be specified in details. From these extensive details, the costs required could then be developed. It is assumed that a full studio with several production stages, rehearsal facilities, art and display facilities, planning and preparation facilities, etc. would be prepared. Cost estimates for these facilities will be found in Chapter Eight.

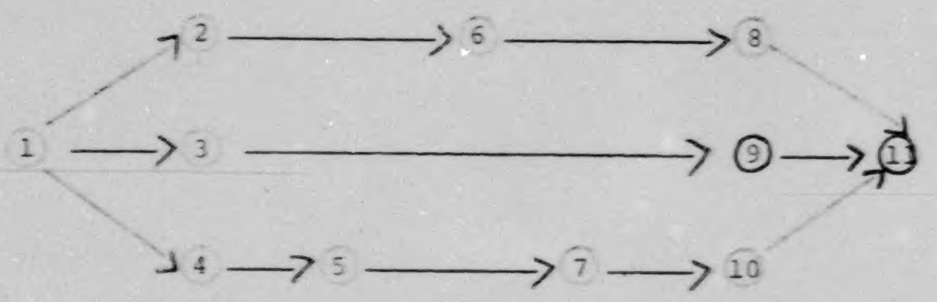
Lighting and Staging Equipment. The specifics of lighting, instructional devices, furniture, and other requirements will be determined, in the final analysis, by the specific courses that are taught by TV.

2. Reception Facilities. At each school included in the ETV system, it will be necessary to have adequate facilities for reception. This category includes the television receivers, monitors, antennas, frequency convertors, and such needed to permit reception capability in all schools on a time-phased basis.

Careful development of a package purchasing concept should make it possible to acquire receiving units for approximately $100 each. A carefully developed plan for installation of receivers will need to be worked out with reference to electricity requirements, reception in school area, etc.

3. Distribution Equipment. A microwave line of sight distribution system would serve as the most feasible transmission system. The existing microwave system of 21 towers distributed throughout Korea could be readily adapted to meet the needs of three additional channels, by the addition of extra transmission dishes.

A simplified action line for the ETV hardware development system is illustrated below. The three major components are developed in a parallel fashion, with culmination in a test of the system. It is not, of course, necessary to have all receivers installed to test the system, but some receivers at the various disparate locations should be installed.



1. Start Point
2. Reception Equipment Requirements Survey
3. Facility Location Choice
4. Begin Microware Modification
5. Facility Development or Construction
6. Reception Equipment Production or Purchase
7. Facility Equipment Installation
8. Reception Equipment Installation
9. Microware Completion
10. Facility Completion
11. System Test and Calibration

Personnel Development Process

From the outline in Chapter Four, it is possible to identify the new or modified personnel forms which will be required in the new system. These include the master teacher or learning manager, the professional teacher and the para-professional teacher. Also required will be a limited number of television teachers who will be responsible for the ETV presentations. Since the proposed system includes major structural and performance changes, it is appropriate to consider the new training requirements generated at all levels. To outline the suggested procedures for development of personnel, a sequence of seven steps is suggested. These steps may be illustrated as follows:

Functions/Task Analysis
↓
Performance Specifications Development
↓
Training Requirements Analysis
↓
Training Programs Development & Validation
↓
Training Programs Implementation
↓
In-Service Adequacy Evaluation
↓
Evaluation

Function and Task Analysis

The differentiated staffing suggested in Chapter Four is a general concept of classroom and school organization which has as its intention achieving better utilization of personnel in an effort to more effectively produce the output of the school and classroom. Differentiation of personnel means to make different, to distinguish by special characteristics, forms, or discriminations.

Traditional staff utilization requires that teachers perform the same general tasks with relatively little regard for training, level of competency, experiences, interest, or the demands of a changing school environment. But within the new model proposed here, the school environment will be different and new requirements will be made.

A prior consideration to the differentiation of the teacher's role is an adequate and thorough description and analysis of the current and future roles. Before specific activities can be assigned to aides, regular teachers, and master teachers, or before the new roles can be adequately defined, the current role of the present teacher must be described and the requirements of the system should be analyzed. It is proposed that two basic activities are necessary to accomplish this:

A. Description of the current teaching role;

B. Analysis of that role in terms of the requirements of the proposed school/learning system.

For purposes of the discussion here, task descriptions are the statements of those activities and events which constitute the interactions of the teacher with the various elements of the learning environment, including the students. In this definition, emphasis should be placed on two aspects:

A. Description, which means literal enumeration of the details of the behavior of the teacher.

B. Events and/or activities, which are units occurring in time and constituting the role behaviors of the teachers.

In other words, it is necessary to know in as much detail as possible those things (events or activities) which the regular teacher does in the course of teaching.

For purposes of this discussion, the second element, task analysis, means the efforts undertaken with the task descriptions to make inferences based on knowledge of the requirements of the system and the kinds of ability, skills and knowledges obtained and required from the human performers, the teachers, as they interact with students and learning environment. Task analysis provides the basis for decisions about various ramifications of system operation, such as reassignment of tasks, automation of certain tasks, introduction of aides, and increased and diversified training. Having the descriptions, it is important to ascertain the logic through which the described units are organized to achieve an end.

This paper has now drawn a distinction between the description of events and the analysis of those events. This distinction will be continued for purposes of clarity, but it is important to note that frequently the two activities occur simultaneously or overlap during the process. For example, some analytic steps are taken prior to making a description, and also during the description the observer organizes events and activities in an analytic fashion, grouping those that obviously go together. This overlapping is to be expected and is useful, but for discussion, the two areas will be treated separately.

Once descriptive information has been gathered, it must be subjected to some form of analysis. An analysis is necessary because an event is not initiated in a vacuum, and it is necessary to find out how events relate to each other, interact with each other, and contribute to some process or objective. One of the first steps is to differentiate between tasks and functions so that events can be related to these concepts. In the description and analysis process,it is possible to differentiate between various levels of detail, the two most important of which are the function level and the task level. Function always implies activity with reference to accomplishment of the end or purpose for which the operating entity exists or is designed. Function is a relatively comprehensive term referring to units constructed to serve a definite purpose or intended to perform a certain kind of work. While in the broadest sense the word could be used to speak of the function of the school or the function of the teacher, it is useful to use it in somewhat limited aspects,such as the function of student evaluation, the function of classroom control, etc. The term task as used here will suggest the imposition by the necessities of the teaching situation of specific units of work that must be accomplished by a person or thing and that as a group (of tasks) would constitute a function.

The design of a model of differentiated staffing in a large system such as the school inevitably involves what tasks will be performed in what pattern. The best organization of human tasks into the job requirements of various individuals and the patterning of these tasks is the question which is being addressed here. Efforts should be made to identify those options which will tend to optimize selection and training, lower ability requirements,and reduce standby, turnover and other factors of operational and economic significance in the system. Task descriptions provide input information for repatterning tasks into differentiated jobs. Also, the various roles in the teaching system require certain behavioral requirements of the personnel filling the job. One of the most fruitful ways of deciding on the behavioral requirements and,of course,the training characteristics is by analyzing the various task features of the job.

A general statement of functions is useful to begin structuring the task analysis. This statement of the functions assigned to the teachers in the classroom usually has been specified by the system supervisors. During the initial layout of what the general functions of the system are to be, it is useful to look into classes of components and what these components will perform. Another factor to be cognizant of is the environmental conditions affecting the classroom.

There are a number of features about the task which are important. The first of these is the goal conditions, i.e., what are the goals of the person performing the task,and when or what contextual or stimulus events indicate to him that the task must be done,and when will the time arrive to initiate its performance? What stimuli occur in the environment,and how are they identified by the person doing the job? What are the short-term and long-term retention factors? What are the various classes of response options, response implication, goal priorities,and rules for selecting responses in terms of problem situations? The key to understanding the process of teaching is to reduce it into finer and finer segments until all aspects of the process are completely understood. To give an example, in general, it is not enough to say that the teacher "teaches," but go a step further and ask, "What does the teacher do when he teaches?" One way of discussing this is to say that the teacher dispenses information to the students and checks whether or not the students receive the information. The teacher also controls the environment in which the previous two activities take place. This is a beginning in analyzing the role of the teacher.

Among the functions which might be anticipated within the proposed staffing model are the following:

1. student diagnosis: diagnosing the learning needs of students on a periodic basis.
2. prescription: prescribing appropriate learning sequences to enable the learner to fully develop his potential, drawing from the available means and resources.
3. goal setting: helping the student to establish relevant educational goals.
4. group instruction: through means of group instruction, providing the appropriate learning experience and assisting the learners in proceeding through portions of the program.
5. instructional monitoring and augmentation: monitoring the instruction presented through the ETV system, leading discussions based on the televised instruction, elaborating examples of principles or concepts offered by televised instruction, helping to develop positive affective responses toward the televised instruction, etc.
6. evaluation: monitoring the performance of the educational system in the school through the various performance variables which have been established.
7. motivation: the provision of motivational consequences for learning in the environment.
8. environment control: management of the environmental logistics.
9. records maintenance.
10. personal development: the continued self-renewal of staff members.

Through careful analysis each function is divided into the tasks which comprise it. For example, the function of student diagnosis might contain such tasks as:

1. analysis of background data
    a. ability level
    b. student preferences
    c. maturity level
2. analysis of placement test results
3. analysis of unit or section test results
4. analysis of individualized instruction worksheets
5. determination of length of time spent on units analyzed
6. establishment of student motivation

The examples of function and task generated here seem to flow logically from the model described in Chapter Four. The process of generating an extensive description of the teacher's role should be developed from a broad and representative sample of Korean schools. The results of the role descriptions should then be combined with the apparent requirements of the model to form the basis for performance specifications.

Performance Specifications

On the basis of the preceding step, the various positions under consideration should be described in terms of performance specifications for the positions. The process of developing the performance specifications requires generation of the specifications from (a) the task and function analysis of the preceding step, (b) the anticipated requirements of the model, and (c) knowledge of the cultural and social factors specific to the Republic of Korea. Within these boundaries the specifications for personnel performance should be prepared. It is not possible to suggest how many distinct statements or specifications will be given for each position, but it should be apparent that there will be major differences between specifications at each level. The specifications for the master teacher should be greater in number and in complexity of skill required than those for the professional teacher. The specifications for the team aide should not require extensive knowledge of technical subjects but should emphasize logistical or maintenance skills.

The specifications should contain a behavioral objective or a group of behavioral objectives, the probable conditions of their employment or performance, the probable frequency of their requirement within the role, and the level of performance required.

It is possible for the performance specifications to be developed in general groups with an end result of a large pool of specifications. These might then be analyzed by various groups of Korean educators who would suggest optimal assignment and grouping of the specifications to constitute the specific roles. Through iterative screening by various groups, a general consensus could be derived of the behaviors constituting each role.

Training Specifications

The performance specifications should be accompanied by statements of the general and specific types of training which should be used to develop the behaviors involved. To facilitate the development of the training programs, the training specifications should include statements of the specific treatments to be used, the materials to be used, and the evaluative techniques to be used. Examples are:

Treatments
1. Cooperative activity
2. Demonstration
3. Direct experience
4. Discussion
5. Lecture
6. Individual study
7. Observation
8. Skill development

Materials
1. Audio-visual materials (full-range)
2. Textbooks
3. Library materials
4. Resource materials
5. Laboratory materials
6. Programmed instruction
7. Other materials

Evaluation
1. Demonstration
2. Written tests
3. Cumulative records
4. Interviews
5. Operation--Performance
6. Oral reports
7. Self-appraisal
8. Socio-Metric techniques
9. Others

These examples should be included as part of the training specifications. The performance specifications are each combined with the three aspects of training in the following manner:

Performance Specifications
- Conditions
- Frequency
- Criterion

Training Treatment
- Materials Required
- Evaluation Procedure

Program Development, Validation and Implementation

Extensively detailed performance and training specifications will have been developed prior to this phase of the training program. The main objective in this stage is to translate the specifications into programs of action which can be disseminated to the various teacher training institutions in Korea. One approach to this would be to have KEDI develop the programs and disseminate them to the various institutions. This approach has the advantage of increasing the reliability and similarity of the programs. Another approach is to send the detailed performance and training specifications to the various institutions and have each develop its own training program. Other methods than these two may be developed to be particularly responsible to the Korean situation.

Within this framework, it will be necessary to control to a distinct extent the numbers of personnel being trained for each level. Obviously, large numbers of those who are currently teaching will wish to become master teachers, but there are a limited number of available positions for master teachers and it must be emphasized that the positions should be filled on the basis of performance criteria. The appropriate model is for the current teacher to volunteer for selection for inservice training and upon completion of the training and successful performance on the criterion-referenced performance measures be certified a master teacher. It will be vitally important to the success of the innovative program that those teachers in the critical team leadership position of master teacher understand and perform in the appropriate manner.

There will also be extensive retraining for the associate teachers. Their positions will also have many new performance characteristics which they will need to learn. The inservice training effort required here will be significant and will require careful planning.

Throughout this stage, extensive attention must be given to the balanced development of both inservice and pre-service training programs. Initial emphasis will have to be placed on inservice programs with later emphasis on the pre-service programs. The pre-service programs will be able to profit from the feedback gathered at the inservice level and the packaged teacher training materials should be useful in both situations.

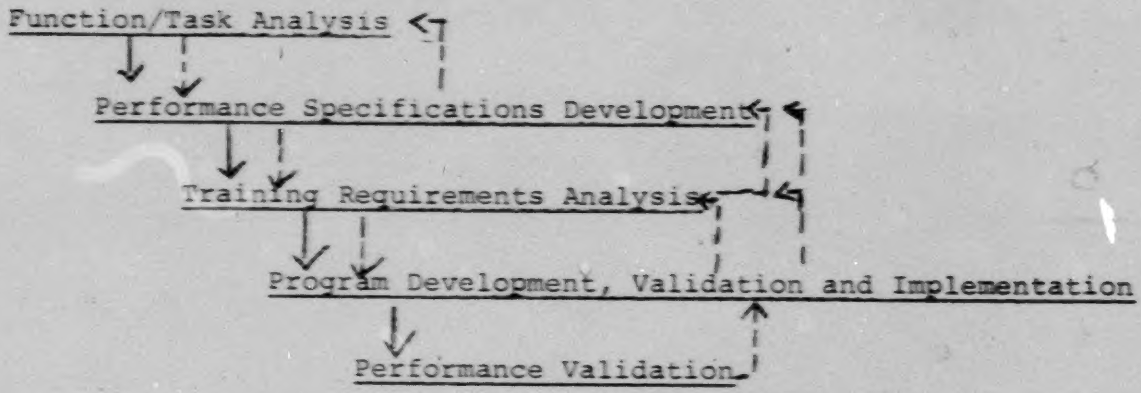
The type of validation emphasized at this level is a course validation. If a particular inservice course requires the mastery of 500 training/performance objectives, the validation effort will focus on the number of trainees achieving various percentages of the objectives over certain periods of time. Attention will be paid to the most effective objective-materials-evaluation mixes to see which seem to teach the most trainees in the least time.

Performance Validation

After training of the various personnel, it will be necessary to ascertain if their training actually results in the appropriate in-school performances and if those performances are adequate for operation of the system. This will require the development of field survey methods including direct observation, surveys and questionnaires, etc. It will be necessary to see if the performances of the teams and of the individual members are consistent with the performance specifications which have been established for them. Discrepancies will have to be analyzed and the information fed back into the training programs for correction of training. It is probable that in the earlier phases of performance specification development several important aspects of performance will have been overlooked or unanticipated. At this point in the program, it is necessary to discover these aspects and modify the earlier segments to allow for continuing inprovement.

Evaluation System

Throughout this discussion the feedback from each subsequent activity to its precedents has been mentioned, but at this point it is appropriate to reemphasize it. The type of evaluation system being emphasized for this component is consistent with the overall system put forth in Chapter Eight. The emphasis is on decision-oriented information designed to maximally contribute to the developmental process. After-the-fact, conclusion-oriented information has a much less important role in this process. To find out after-the-fact that several errors were made is not as useful as to know during the process that the errors occurred so that immediate correction may be made. A general outline of the "feedback" system is shown next, with feedback represented in broken lines.


Function/Task Analysis
Performance Specifications Development
Training Requirements Analysis
Program Development, Validation and Implementation
Performance Validation

Systems Management and Administration

Educational systems such as the one suggested for Korea require sophisticated procedures for management. Tools and techniques have been developed within five principle areas which can be brought to bear on the design of management of the Korea system. These areas are operations analysis, economics of education, environmental planning, management information, and organizational structure and functions.

Operations Analysis

Operations analysis has developed over the past three decades. Early applications were primarily military management types. Central problems involved allocating resources, scheduling, gaming, simulation and systems design. Business and industry soon picked up the quantitative approaches to management. Educational management, because of system size and complexity, has been forced to follow the lead of the military and industry. Today the management technology associated with operations research and systems analysis are applied wherever organized management exists.

Economics of Education

For several years an international organization, OECD, has been concerned with planning problems on national levels. The organization's quantitative approach to planning has added greatly to the literature on economics of education especially in emerging countries.

Problems associated with manpower projections, returns on education, planning programming budgeting systems, and utility/cost analysis represent areas requiring sophisticated technology rather than routine study. Recent concerns regarding accountability in education also reflect the need for greater sophistication in educational decision making. Especially at the micro analysis level where cross-country replication is feasible and desirable

Educational Environmental Planning

A third area is associated with man-environment interaction, where learning is concerned. This calls for detailed study of various interacting elements within the environment and how those elements affect the learner. New approaches regarding land use, learning ecology, environmental design through computer graphics, and the maximum utilization of physical resources are helping the educational process.

Management Information Systems

A fourth and major area for management has been associated with information. The size and complexity of educational systems have precluded appropriate decision making without the benefits of computers. Computer utilization, therefore, has shifted from early esoteric uses such as fiscal management to the role of a total management information system. As such, the management information system is analogous to a central nervous system. For monitoring operations and assuring effective operating procedures, the management information system is the total integrating force for the organization.

Organizational structures and functions

Organizational structures and functions are concerned with the problem of maximum utilization of staff and facilities. Modern organization approaches emphasize increasing use of technology to assure effective mix of staff, facilities and resources.

CHAPTER EIGHT

PILOT PROJECT AND COST ESTIMATES

The introduction of any innovation into an existing operating educational program is a difficult and complex job. Never has a national educational reform as sweeping as that recommended for the Republic of Korea been undertaken. For such an educational reform to be successful in implementation, a great deal of care must be given to the planning of development and diffusion strategies. In addition, there are three categories of cost which must be carefully analyzed and the best possible predictions made as to what these costs will be. These costs are those associated with (a) development, (b) installation in the schools, and (c) the recurring operating costs. The development and set-up costs are effectively one-time investments for a better, more efficient school system. Ideally, these investments should yield a higher quality education whose recurring operational unit cost is lower than the educational system it is designed to replace.

Figure 8-1 shows a hypothetical relationship between the operation costs of an old system and a new one, following investment in development and installation of the new system. Historically, in Korea, almost no expenditures of any significance have been made in developing new and alternative educational programs.

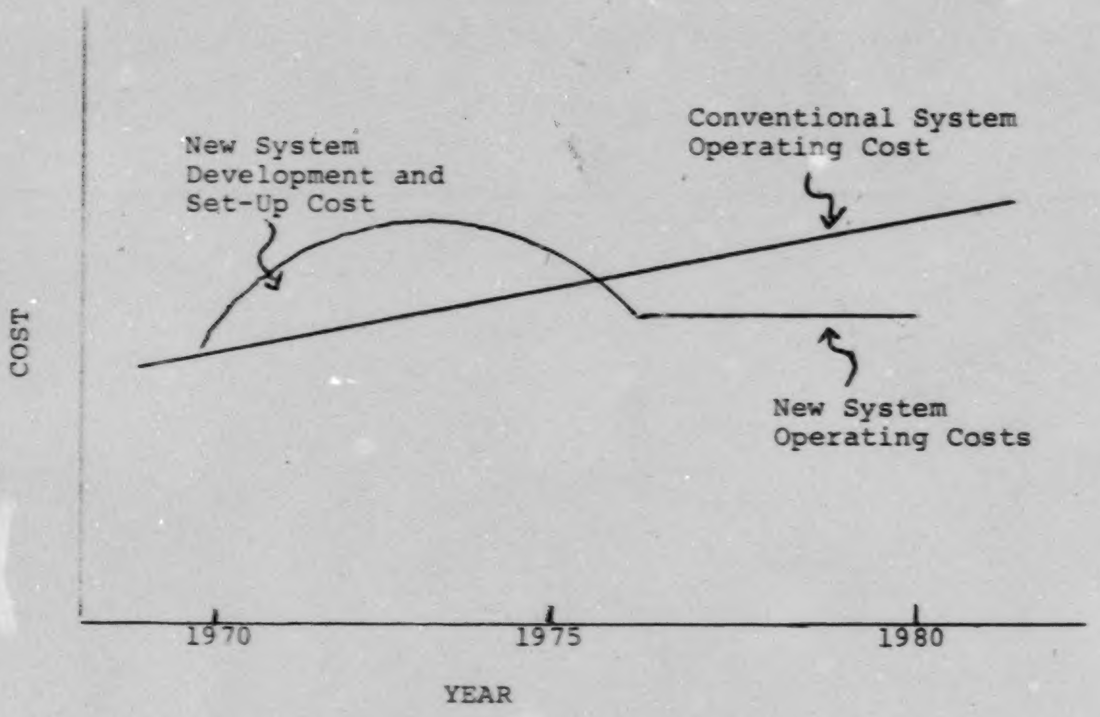


Figure 8-1. Hypothesized Comparison of future operating costs of "old" and "new" educational system with front end development and set-up investment.

Rationale for Pilot Project

The system recommended by the study team, while not having been built and tried out in total anywhere in the world, does consist of components such as differentiated staffing, individualized instruction, instructional television, etc., which have been used and for which some development and operating cost data is available. In making estimates for Korea, a great deal of adaptation and extrapolation has been necessary. For example, there is a substantial body of experience in developing programmed instruction in the United States from which information about man hours by type and level required for the development of an hour of programmed instruction can be derived. Two adaptations of this information are necessary for it to have generalizability to the Korean program. First, developing individualized student learning units is similar in many respects to developing programmed instruction--but it is not identical--and the effect of these differences on estimated development costs must be taken into consideration. Second, the estimated man hours by type and level have had to be costed in terms of professional and technical wages of the current Korean salary structure. Since there are so few people doing this type of work in Korea today, the study team's estimates will possibly have a fairly large error margin. In the early phases of detailed project planning by Korean researchers, it should be possible to refine and firm up these estimates so there is a relatively small and predictable error range. Errors in estimating the development cost are much more tolerable than errors in estimating either set-up or operating costs. Not so when cross country replication is possible

[illegible]

Because of the importance of knowing with precision the per student operating costs and the yield in terms of assessable student learning,the study team strongly urges that the total effort be inaugurated with a carefully developed and tested pilot project. This would have several advantages. It would permit the program to be tested in a miniature situation more amenable to control. It would free the development team from the myriad problems associated with nationwide diffusion during the development phase. But most important, it would provide the Korean government with a decision point before committing to a full-scale, nationwide implementation effort. It is proposed that the pilot project will include the development of a complete new system having the features outlined in Chapter Four and that it will be installed initially in the schools of only a single city. The community chosen should be as representative as possible and not too large. For example, Seoul and Pusan should not be selected because of the enormity of their school populations and all the problems associated with their rapid metropolitan growth. The Ministry of Education, in making this decision, should insure that the pilot community doesn't have atypical problems or advantages.

Since the principle purpose of the pilot project is to provide an empirical data base for a government decision on diffusion of the new system, the pilot school system should not have any unique advantages nor disadvantages that would effect the potential educational outcomes. The pilot should yield answers to many important questions:

Do the differentiated teaching teams work effectively?

What is involved in staff retraining and development?

What is the actual per student operating cost of the new program?

What are the measurable effects on student learning?

Is the space allocation adequate?

Are the number of television sets sufficient for the numbers of children assigned to watch them at any one time?

Is the TV and radio transmission system sufficiently reliable?

Are the student learning units manageable by the students?

Are the evaluation instruments and techniques yielding the needed information?

What are the reactions of students, teachers and parents to the new programs?

Are the support mechanisms appropriate and sufficient at the provincial and national level?

What will the costs be of installing the program in all schools of the Republic of Korea?

These and other questions should be answered before the total commitment is made. On the other hand, the Korean government should carefully analyze the feasibility of the system recommended by the study team before undertaking even the pilot project. A rough estimate of the development and installation costs of this program on a nationwide scale is nearly five billion Won,but the pilot for only a single city will cost almost half that amount. This is due to the substantial portion of the total cost allocable to materials and curriculum development. Development of a student learning unit or an ITV program is the same whether the materials are used by ten students or 100,000. Other costs can be saved, or at least deferred, by undertaking a pilot project first. Teacher training will be limited to only the participant teachers; materials need be manufactured initially in only sufficient quantities for the number of students in the pilot school system; and the ITV set up--origination, transmission and reception--will be localized,using either cable or microwave linkages.

Estimated Development and Installation Costs

Table 8-1.

Summary of Development Costs for Total Nationwide	System
Software Development	$ 5,474,000
Teacher Training	2,836,428
Television Monitors & Antennas	3,241,736
Transistor radios	656,704
TV Originating Source	500,000
Transmission System	2,860,000
KEDL Professional Staff Development	390,000
Total	$15,958,868

Table 8-1 summarizes the major categories of cost for development and installation of the new programs if this were to be done for the entire nation. The largest single cost here is for the development and validation of the software. The software is perhaps the most critical component of the proposed system and will range from the student learning units, complete with objectives, self-instructional material and formative tests to the ITV and radio programs with their associated support materials. The study team has estimated that approximately 7,920 hours worth of instructional programs will need to be developed and validated for the full nine-year schedule. This is based on an estimate of four hours of programmed materials needed per school day for each of 44 school weeks for nine academic years. The study team has arrived at a per hour of instruction development cost very low how est.? of $700, or roughly eight man weeks of time plus appropriate resources. This is considerably more than has been spent on educational materials development in the past in Korea. But in order to achieve reliable and demonstrable teaching effectiveness of the program, the analysis, development, revision cycles and validation is much more involved than for conventional instructional materials. Experience in Japan, the United States and other countries has consistently shown that the development of these new kinds of materials are several times more costly than for traditional textbooks. What has been neglected in these situations is a demonstration of their contribution to the ultimate reduction of instructional costs.

It is assumed that these funds would represent the largest portion of the operating budget for the Korean Educational Development Laboratory. During the detailed planning phase KEDL will need to refine these development cost estimates so that the courses, hours of instruction, and the associated expense of their production can be more precisely estimated.

The second category of cost shown in Table 8-1 is for the in-service training of the members of the differentiated teaching team. It assumes that criteria and selection procedures will be worked out for selecting the master teachers, associate teachers, and aides. It is likely that initially all of these staff personnel will be drawn from the teaching personnel presently employed in the Korean system. From this group of elementary and middle school teachers, whose experience, educational background, competency and leadership potential will be highly variable, 27,346 persons will be chosen as master teachers.

These will doubtless be rather highly qualified professionals who will need training in the new roles they will occupy as managers of the learning environment. Special teacher training materials will be developed for use with these groups so they will learn under conditions parallel to those under which they will be teaching later. It is estimated that the master teachers should receive three months of intensive inservice training and, from information about current costs for special teacher training programs in Korea, this should cost about 4,594 Won per teacher for each of the three months or a total training cost of 13,782 Won per master teacher. $36.96 w = 372

The associate teachers are estimated to need two months training for a per teacher training cost of 9,188 Won. $24.69 The aides would receive one month of training at a unit cost of 4,595 Won, which for 54,692 aides would cost @372 w = $1.00 674,446.20 $810,500.00. w = 372 or less With the three, two, and one month training programs, it should be possible to have a period of overlap so that the personnel get actual experience in working as teams.

Based on the estimate of 27,346 instructional units consisting of 300 students per unit, 3,172,136 = 27346 x 116 $3,241,736.00 will need to be spent for classroom television sets. This is based on an estimated cost of $116.00 per set and will provide one set for every 300 children, with 600 sets to be used in maintenance rotation. Three transistor radios would be provided for each teaching unit at eight dollars apiece. The originating facility would consist of a major studio at $200,000.00; a rehearsal studio at $125,000.00; and additional equipment (telecine, film development, etc.) for $115,000.00. With $60,000 required for installation and miscellaneous costs, the total for the originating facility would be approximately $500,000.00. The transmission system, a microwave system with studio transmission links is estimated to cost $2,860,000.00. Thus a national educational radio and television network for Korea could be developed in the cost neighborhood of $7,258,440.00, exclusive of teacher training, programming and materials development.

The last category of expenditure shown in Table 8-1 is for the development of the key staff personnel for the Korean Educational Development Laboratory. It has already been noted that Korea has a number of highly qualified professional educational researchers who could provide the top management and leadership in KEDL. It is probable that,by drawing on the currently available qualified resources in Korea, the first and second lines of KEDL management could be staffed. The third level of supervisory and technical specialists do not appear to be available in sufficient numbers to undertake a development task of the scope envisioned. Consequently, it will be necessary during the first phase of the project (about one year) to identify for training against specific technical requirements approximately fifty Korean educators. These people will need to be trained in a variety of specialties including how to define behavioral objectives, media development and validation, instructional systems design, management planning, educational and evaluation technology and others. A first task for the nucleus beginning staff of KEDL is to estimate the number of persons critically needed for each specialty. Candidates for these specialty areas would then be recruited to the KEDL staff and dispatched abroad for a year's intensive training in an appropriate cooperating institution or agency. For example, two or three people might be placed in the Children's

Educational Television Workshop (the producers of "Sesame Street") in New York City; some might be sent to Dr. Cole Bembeck of MUCIA to learn advanced planning techniques; and some might be sent to Florida State University to study instructional systems design. This would not delay the overall development effort of the project because it will require at least a year for the detailed planning for the project to be completed. This work can be underway by the nucleus KEDL staff while the training of the other staff is going on.

This training for each trainee is estimated to cost $7,800.00. This includes $1,000.00 for travel, $4,800.00 annual salary, and $2,000.00 for tuition, books and materials. For fifty trainees this cost would total $390,000.00.

178,000.00 x 2.2 yrs of [illegible]

Table 8-2. Summary of Development Costs for Pilot Project--Based on 100,000 Student School System

Software Development	$5,474,000
Teacher Training	34,543
Television Monitors and Antennas 333 @ $116	38,628
Transistor Radios 1000 @ $8	8,000
TV Originating Source	500,000
KEDL Professional Staff Development	390,000
TOTAL	$6,445,171

In Table 8-2 are shown the costs for the project if it were to be installed in only a single community rather than the entire nation. For purposes of computation we have taken a community of 100,000 students in the first-through-ninth-grade range. It can be seen that the installation costs are sharply reduced--for example, no transmission-relay system would be required and only 333 teams of teachers would need to be trained. However, the development costs remain the same with the total pilot project estimated to cost $6,445,171.00. Almost none of this money would be wasted because of its being a pilot. If a decision is made to take the program nationwide after the pilot system becomes operational, this could probably be done for the difference between the totals shown in Tables 8-1 and 8-2, or for an additional $9,443,689.00. Put another way, the Korean government can defer nearly ten million dollars in risk investment in a new educational system until hard data is collected on the cost and effectiveness of the new system in trial form. There is no direct fiscal penalty for this two phase approach, but, of course, nearly eight million children will be out of the new system for two to three years longer than would be the case if decision were made to go nationwide at the onset.

Estimated Operating Costs of the Proposed System

One of the conclusions of the Council for Long Range Educational Planning as well as the Korean Federation of Educational Associations is that the situation regarding teacher salaries in Korea is desperate. The study team felt that it was critical to include as a part of the plan provisions for substantial upgrading of teacher salaries. The desirability and, indeed, necessity for doing this is probably obvious. If teachers of high ability are to be recruited and retained in the schools, their salaries must be competitive in the economy.

Table 8-3. Suggested Average Salary Structure for Teaching Team.
(in Won)

at what exchange rate
is there a projection available

1 Master Teacher	60,000/month
1 Associate Teacher	40,000/month
2 Teacher Aides @ 15,000	30,000/month
Total	130,000/month

In table 8-3 is shown the breakdown for the three levels of the teaching team. The salaries shown are monthly averages, and an appropriate range above and below the average for each of the three levels will need to be defined. As can be seen, the average teaching team will cost 130,000 Won per month. The salary potential for the master and associate teachers is considerably higher than the current Korean teacher salary schedule.

In Table 8-4 is shown an estimate of the monthly and school year operating expenses for a "typical" small school of 900 students. The average school in Korea has 935 students, though it should be recognized that the arithmetic average is artificial.

and dangerous in projections usage
where marginal calculations are determinants

The model school in Korea has more than 900 students. This hypothetical school can serve, however, as a basis for computing a per student cost. With 900 students and annual operating costs of 8,837,000 Won, the annual per student cost is 9,819 Won. This would be slightly lower in larger schools because the ratio of administration and support costs would not increase in direct proportion to growth in student body size. By the same reasoning, the unit cost in smaller schools would be somewhat higher. For example, a school of 900 students requires one principal and so does a school of 100 students. If this poses a major fiscal problem, Korea may want to study the desirability of consolidating some of the smaller schools.

w = 312 = 31.47
w = 372.8 = 26.33 or 1,443,312 [illegible]
US $ w = 312
[redacted]

Table 8-4. Operating Costs for Single School with 900 Students.

	Monthly	10 Months
1 Principal	80,000	800,000
2 Assistant Principals @ 60,000	120,000	1,200,000
3 Secretaries @ 20,000	60,000	600,000
2 Custodians @ 15,000	30,000	300,000
3 Teaching Teams	390,000	3,900,000
TOTAL PERSONNEL EXPENSES	680,000	6,800,000
Utilities		372,000
Supplies		270,000
Texts, Student Learning Units and Instructional Materials		1,395,000*
TOTAL EXPENSE:		2,037,000
	TOTAL	8,837,000

(See next page.)

*This instructional materials figure is based on four year use of non-consumable materials. The inventory of software for the school is estimated to cost 6,200 per child or 5,580,000 total for a school of this size. A four year amortization of this amount yields 1,550 per student or 1,395,000 total one year cost. This averages to 9,819 per child per year.

It should be noted that the expenditures for educational materials relative to the total operating expenditure is much higher than at the present. This system will make available in the school and at no expense to the student 16.66 6,200 Won worth of instructional materials for each child. This rich inventory of learning resources will have been developed by the KEDL and the cost of development included in their budget. The manufacture and distribution of these materials to the nation's schools are allocated to the recurring operational budget of the school. Furthermore, a four year distribution of the cost of these materials is assumed to be possible through reuse of the materials. In other words, each student will have four times as much learning material available to him as would otherwise be possible. A part of the installation cost will be an "advance" of funds by the government for the purchase of these materials by the schools--these funds to be paid back from operating budgets of the schools through a four year period.

For 8,200,000 first-through-ninth-year students, a per student yearly cost of 9,819 Won would yield an annual educational budget for this segment of the total public educational program of 80,507,000,000 Won. If the same number of children were to be educated at the present real unit cost of 12,878 Won (see Chapter Four), it would cost 104,879,600,000 Won. Table 8-5 shows the study team's projection for growth in Korea's Gross National Product, the government budget, and the educational budget. By 1975, 113.3 billion Won are estimated to be available for Korea's total educational program. The proportion the total budget in 1975 projected to be required for the elementary-middle school budget of 80.5 billion Won would be substantially lower than that segment's share of the 1970 educational budget.

Table 8-5. Estimates of MOE Budget (in billion Won or percentages)

	GNP (A)	Govt. Budget (B)	MOE Budget (C)	(C)/(B)	(C)/(A)	(B)/(A)
1960	246.69	41.99	6.38	15.2%	2.6%	17.0%
1961	296.82	61.42	7.60	12.4	2.6	20.7
1962	348.58	69.48	10.37	14.9	3.0	20.0
1963	487.96	76.32	10.92	14.3	2.2	15.6
1964	696.79	75.40	12.23	16.2	1.8	10.8
1965	805.85	94.65	15.33	16.2	1.9	11.7
1966	1032.04	141.63	25.20	17.8	2.4	13.7
1967	1242.35	178.22	32.09	18.0	2.6	14.3
1968	1575.65	265.72	45.30	17.1	2.9	16.9
1969	2030.14	370.95	59.12	15.9	2.9	18.3

	Estimated GNP (at '69 constant prices) Growth rate = 8.5%	Estimated Govt. Budget (18.5% of GNP)	Estimated MOE Budget (18% of Govt. Budget)
1970	2253.1	416.8	75.0
1971	2455.9	454.3	81.8
1972	2664.7	493.0	88.7
1973	2891.2	534.9	96.3
1974	3136.9	580.3	104.5
1975	3403.5	629.6	113.3
1976	3693.2	683.2	123.0
1977	4008.1	741.3	133.4
1978	4347.7	804.3	144.8
1979	4717.3	872.7	157.1
1980	5118.3	946.9	170.4
1981	5553.4	1027.4	184.9
1982	6025.4	1114.7	200.6
1983	6971.6	1289.7	232.1
1984	7564.2	1399.4	251.9
1985	8207.2	1518.3	273.3

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Appendix A

General Characteristics of the Formal Education System at the Primary and Secondary Levels in South Korea with Special Reference to the Feasibility for Innovation

by

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Florida State University

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I. Education in Korea: The Dimensions

The Republic of South Korea is about the size of Ireland, and it has more than 30 million people who are compacted by the seas east, west and south and by the Demilitarized Zone under United Nations supervision to the north. It is a rapidly developing nation with all the opportunities and ills associated with technological change, industrialization, rapid urbanization and a transition from traditional and relatively stable values to new, uncertain and tentative ones.

Moreover, beyond its own social and economic development, the nation carries the additional burden of a strong military posture and a deep commitment to its own self-defense. This is the result of a long history of foreign invasions, the most recent being the Japanese invasion and occupation of 1910-1945, and the invasion and expulsion of Communist armies from the north in 1950.

The schools of the Republic of Korea undoubtedly have contributed their part to the development of the nation. One cannot deny this contribution when one sees the hustle and bustle of people in a city like Seoul with its five-million inhabitants. There is action: people on the move, people buying and reading newspapers and magazines, and people using those basic skills that formal education provides as they go about their business at home, in the factories and in the market place.

In 1969, more than 7,632,200[1] children and youth were enrolled in 9,478 schools throughout South Korea. More than 158,300 teachers manned the classrooms, and coped with class sizes of 60 to 70 and above. The nation invested 15.9% of its national budget, 3.4% of its GNP, in education (exclusive of parent support of education).[2]

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[1] Statistical data are taken from the Ministry of Education's Statistical Year Book of Education: 1969, Seoul, Korea.

[2] Data from Central Education Research Institute (CERI) based on projections prepared by the Council on Long Range Educational Planning (CLEP).

More than 70% of the children between the ages of 6 and 17 were in school, and the literacy rate was about 90%.

Under President Park Chung Hee and the then Minister of Education, Mr. Kuan Oh Byung, on December 5, 1968, the Charter of National Education was proclaimed. It is displayed throughout Korean schools--even in the remotest corner of South Korea. It is brief but important to read in order to get a feel for the drive and the passion present in Korean education.

The Charter of National Education
December 5, 1968

"We have been born into this land, charged with the historic mission of regenerating the nation. This is the time for us to establish a self-reliant posture within and contribute to the common prosperity of mankind without, by revitalizing the illustrious spirit of our forefathers. We do hereby state the proper course to follow and set up as the aim of our education.

"With the sincere mind and strong body, improving ourselves in learning and arts, developing the innate faculty of each of us, and overcoming the existing difficulties for the rapid progress of the nation, we will cultivate our creative power and pioneer spirit. We will give the foremost consideration to public good and order, set a value on efficiency and quality, and, inheriting the tradition of mutual assistance rooted in love and respect and faithfulness, will promote the spirit of fair and warm co-operation. Realizing that the nation develops through the creative and co-operative activities and that the national prosperity is the ground for individual growth, we will do our best to fulfill the responsibility and obligation attendant upon our freedom and right, and encourage the willingness of the people to participate and serve in building the nation.

"The love of the country and fellow countrymen together with the firm belief in democracy against communism is the way for our survival and the basis for realizing the ideals of the free world. Looking forward to the future when we shall have the honorable fatherland unified for the everlasting good of posterity, we, an industrious people with confidence and pride, pledge ourselves to make new history with untiring effort and collective wisdom of the whole nation."[3]

---

[3] Text from the Statistical Year Book of Education: 1969 op. cit.

Education in South Korea is compulsory through sixth grade (ages 6-11). Education is not entirely free, for tuition fees and other fees must be paid--except for the very, very poor--at the secondary level, and to a lesser degree, at the primary level. This is discussed in greater detail in the section entitled "Student Fees."

There are many private schools in South Korea and these account for 1.6% of the number of schools at the primary level, 45.1% at the middle school level, 46.9% at the high school level, and 70.7% at the college and university levels.[4]

Schools in South Korea are organized into four levels: the primary school (grades K-6; ages 6-11), the middle school (grades 7-8; ages 12-14), the high school (grades 10-12; ages 15-17), and post-secondary education with varied programs varying from 2-year junior colleges to 4-year colleges with post graduate and professional programs extending beyond.

Chart A-1 depicts school organization by levels and ages:

Several explanatory comments should be made about the chart showing the organization of the schools of the Republic of Korea.

With respect to the Kindergartens, this program is not an extensive one. Only one Kindergarten was reported in 1969 as a public school Kindergarten; most of the Kindergartens (459 of them) are privately operated.

The age scale may vary a year upwards because some children may start first grade when they are seven years old rather than at age six as shown on the chart.

The Civic Schools offer literacy and basic education programs, and were established after 1951 to meet the educational needs of children and youth who had been deprived of schooling during the war.

The Trade Schools offer pre-employment vocational education in such trades as carpentry, repair and maintenance and electricity.

The Junior Technical Colleges offer courses in such fields as engineering, agriculture and forestry, marine and fisheries and others. In 1969, there were 23 such colleges, 15 of them public and eight private. Slightly less than half of the students are enrolled in engineering courses, followed by agriculture and the marine and fishery courses.

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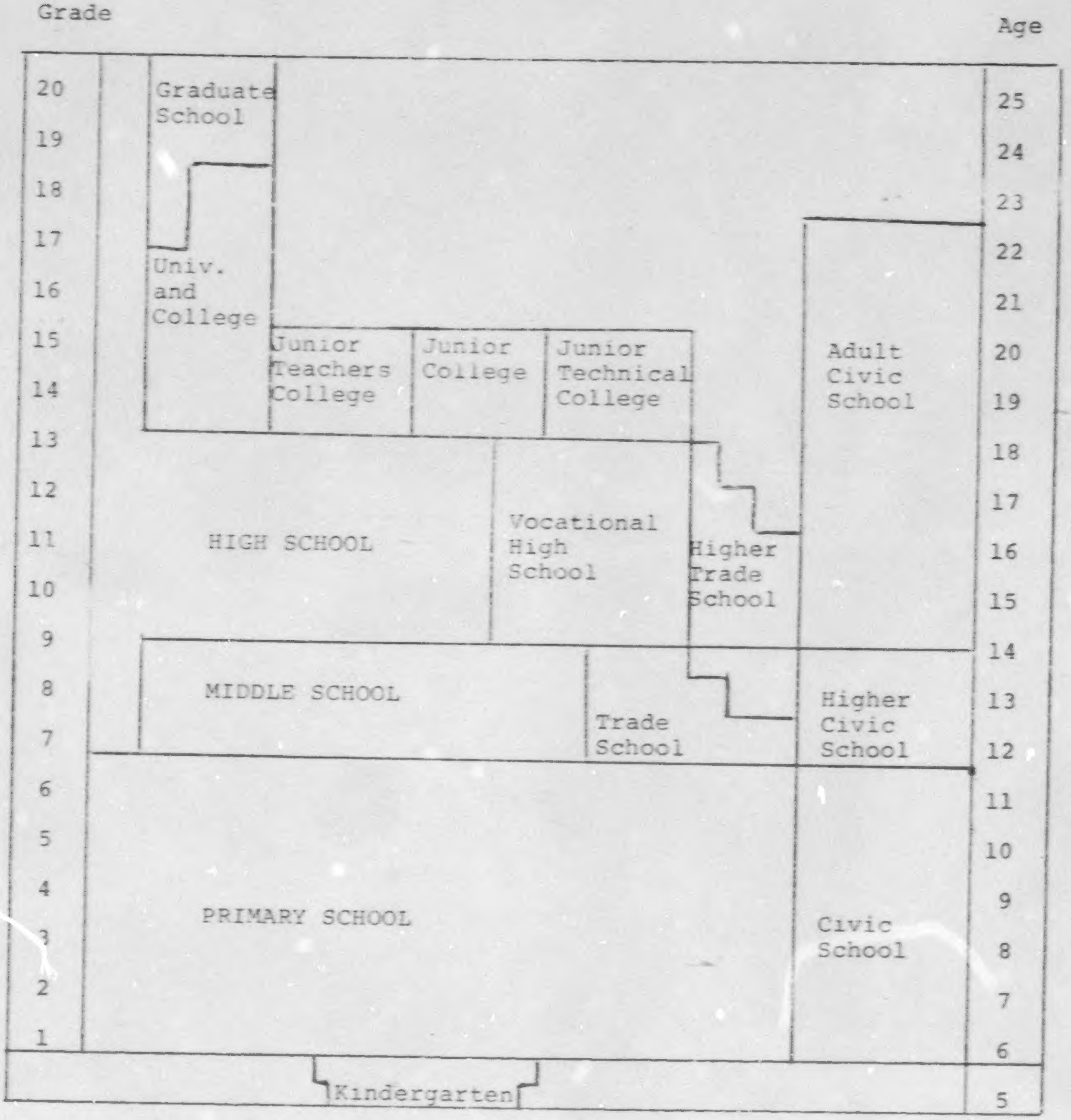
[4] Figures from CERI.

Chart A-1. Organization of The School System of The Republic of Korea - (1970)


Grade
Age
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12
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8
7
6
5
Graduate School
Univ. and College
Junior Teachers College
Junior College
Junior Technical College
HIGH SCHOOL
Vocational High School
Higher Trade School
Adult Civic School
MIDDLE SCHOOL
Trade School
Higher Civic School
PRIMARY SCHOOL
Civic School
Kindergarten

(Adapted from Education in Korea: 1968-69, Ministry of Education, Seoul, Korea 1968, p. 2.)

The 444 Trade or Vocational High Schools offer programs in major areas--such as agriculture, industry and commerce. These major areas are sub-divided into such specific fields as zootechny, horticulture, carpentry and architecture, and include programs of specialization in the arts: music, fine arts and dance.

The critical differences between the nature of the programs of the Trade or Vocational High School and the Junior Technical College are difficult to ascertain. Some teachers interviewed on this point reported that the public, and even the employers of the schools graduates, did not understand nor distinguish among the graduates of the three-year or five-year Vocational High Schools, nor among the graduates of the two-year Junior Technical Colleges. All were considered members of a mixed pool of job candidates who were selected by means of factory-designed-and-administered competitive job-entry examination.[5]

The Junior Colleges, all twenty of them private in 1969, offer such programs as linguistics and literature, arts, humanities, social sciences, physical education, engineering, medical science and pharmacy, agriculture and forestry, marine and fishery, and teacher training.

Sixteen two-year Junior Teachers Colleges were reported in 1969 and offer programs for the preparation of elementary school teachers. These colleges had an enrollment of almost 10,500 students. Approximately 26% of the students were enrolled in the social sciences, 18% in engineering programs, 10% in the natural sciences, and 10% in medicine and pharmacy, followed by linguistics and literature, education, and others.

Since the abolition of entrance examinations will take place in its third and final stage in the 1970-71 school year, education will most likely become general and practically compulsory from first grade through the sixth and onward for the additional three years of middle school, thus making Korean education a generalized six plus three, nine-year program.

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[5] Teacher Interviews, 7 August 1970.

II. The Administrative Structure of Education and National Education Decision Making in South Korea

The Ministry of Education (MOE) is empowered by law to make educational policy and to supervise, control and guide the schools of the nation. This responsibility is in the hands of the Minister of Education who is one of the members of the President's Cabinet and is the head of the Ministry.

A general chart of the Ministry (Chart A-2) depicts the organization of the Ministry of Education as of July 1970. The organization of the MOE reflects the usual specialization required to fulfill the functions of a national, centralized ministry. But there are unique features.

Of special interest is the Task Force for Resident Abroad Education (right hand side of chart) that provides liaison and guidance for schools located in foreign territories such as in Japan and Taiwan where there are large Korean populations. These schools offer Korean language and history, and try to preserve the cultural heritage of Korean children who live abroad.

The MOE has also created a Task Force for audio-visual education and has housed it in the Science Education Bureau.

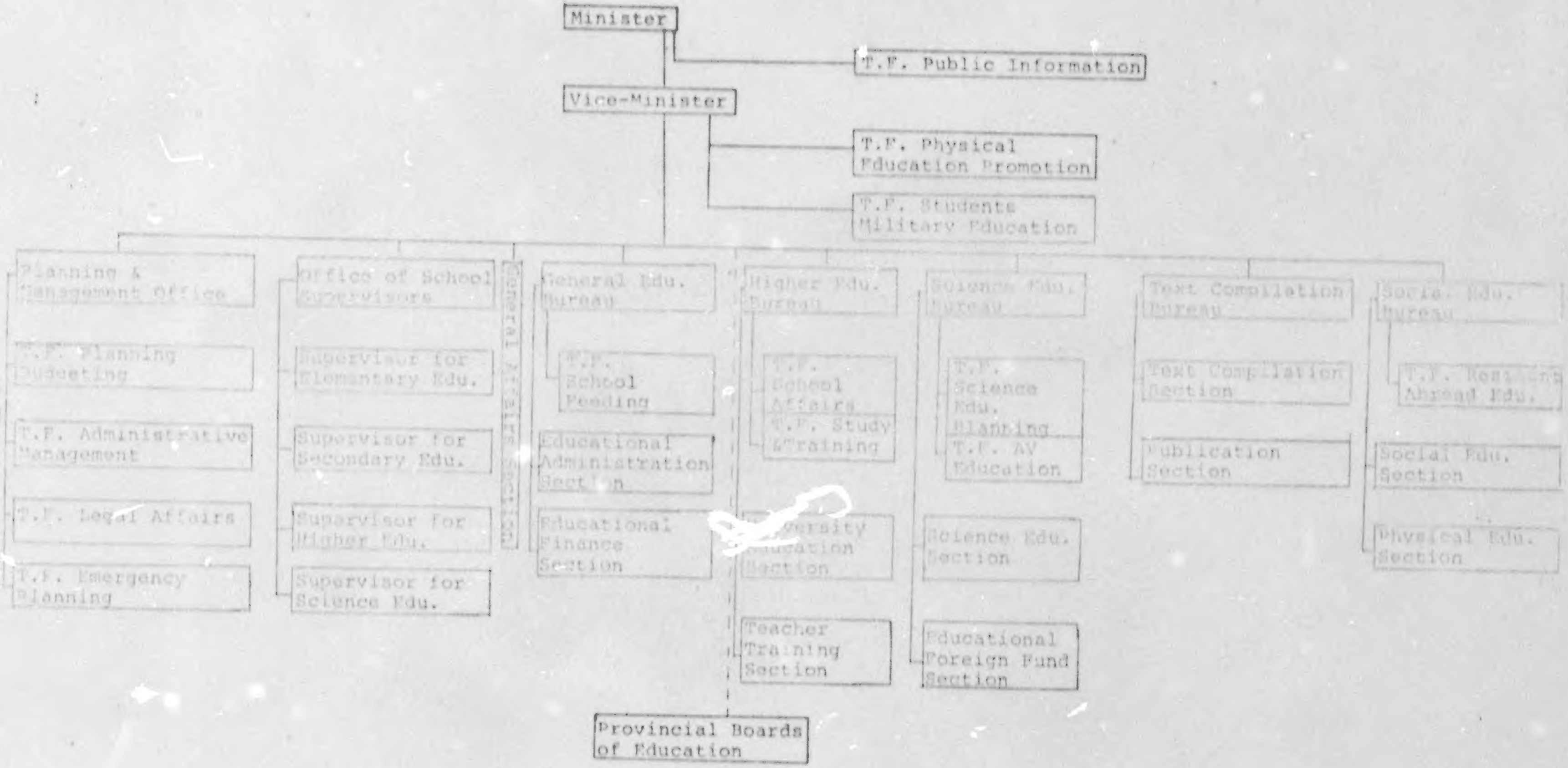
The Office of Planning and Management is another feature that provides for rational utilization of information and for the balance of long and short range need against present and future resources. Nevertheless, the function is such a crucial one that special groups have been set up on an *ad hoc* basis, e.g., Council on Long Range Educational Planning (CLEP) to assist in the work. Befitting its importance, CLEP's chairman is the Prime Minister, Chung Il Kuan.

Also noteworthy are the special places given to science education: a Science Education Bureau, and a Supervisor for Science Education. Physical and Military Education enjoy a special place through the special Task Forces under the Vice Minister.

Viewed together, the emphasis on Resident Education Abroad, on Planning and Management, and on Science Education and Physical and Military Education reflect the strong thrust given by the government to these areas of national development.

The operational lines of the MOE extend through the Boards of Education to the schools in each of the nine provinces, plus Seoul and Pusan which are considered as two special cities. But at the higher education level and above, the administrators in the field deal directly with the MOE in Seoul without having to go through the local Boards of Education.

Chart A-2


Minister
T.F. Public Information
Vice-Minister
T.F. Physical Education Promotion
T.F. Students Military Education
Planning & Management Office
T.F. Planning Budgeting
T.F. Administrative Management
T.F. Legal Affairs
T.F. Emergency Planning
Office of School Supervisors
Supervisor for Elementary Edu.
Supervisor for Secondary Edu.
Supervisor for Higher Edu.
Supervisor for Science Edu.
General Affairs Section
General Edu. Bureau
T.F. School Feeding
Educational Administration Section
Educational Finance Section
Higher Edu. Bureau
T.F. School Affairs
T.F. Study &Training
[illegible]versity [illegible]ucation Section
Teacher Training Section
Science Edu. Bureau
T.F. Science Edu. Planning
T.F. AV Education
Science Edu. Section
Educational Foreign Fund Section
Text Compilation Bureau
Text Compilation Section
Publication Section
Social Edu. Bureau
T.F. Resident Abroad Edu.
Social Edu. Section
Physical Edu. Section
Provincial Boards of Education

Abbreviation: T.F. - Task Force of

July 1970 (CERI)

The MOE organizational structure has not been a static one, for since its inception, many chances have occurred. As reported by CERI in a special research report on the MOE:

> "At the time of the establishment of the Republic of Korea Government, the Education Ministry consisted of one office, five bureaus, and 22 sections. It has undergone eight organizational revisions to date. Until the sixth revision effectivated shortly before the military revolution equipping the ministry with five bureaus and 17 sections, divided on the basis of function. With the establishment of the Third Republic, the ministry was further reorganized into two offices, four bureaus, and 14 sections combining the object-centered and functional systems."[6]

As is also well known, organizations in government and out tend to develop their idiosyncratic patterns of functioning and development on the non-formal, non-official levels. So, too, in the ROK, policy and decision-making power are often operative in channels other than within the MOE. The President's Cabinet, for example, plays an important role in educational decision-making, as described in the CERI-COMP report as follows:

> "The Cabinet is the supreme decision-making organ of the Government. The following educational matters require deliberation of the Cabinet under Article 86 of the Constitution:
>
> 1. Basic plans of educational administration and general policies;
>
> 2. Education budget, settlement of accounts, disposal of Government-held properties, various contracts;
>
> 3. Division of authority among various administrative divisions;
>
> 4. Basic plans pertaining to commissioning or distributing of authority inside the Government;

---

[6] CERI. "A Comprehensive Study for the Improvement of Korea's Education System--With Emphasis on Aspects of Administration, Finance and Examinations." A Research Report Prepared for the Commission on Administrative Reforms. Seoul: CERI, Jan. 1966 English Version (Typescript) p. 19. (Hereafter called "CERI-COMP".)

> 5. Evaluation and Analysis of settlement of various administrative mistakes;
>
> 6. Establishment of major educational policies and co-ordination with other Government ministries;
>
> 7. Examination of requests concerning policies submitted to the Education Ministry, or referred thereto;
>
> 8. Appointment of president of national university;
>
> 9. Items submitted by the President, Prime Minister or other Cabinet Members.
>
> The Cabinet is thus an organization which deliberates the major policies of the Government, although it has another feature of functioning as a consultative body to the Office of the President. The Cabinet therefore plays an important role in the making of educational policies.
>
> Efforts should be made so that each Cabinet Minister correctly understands the importance of education and its urgency.
>
> From primary education up to university-level education, the problems of education in Korea are acute. Enormous expenses are required to solve these problems. The Education Minister alone would not be sufficient to marshal the financial strength required; he would need close co-operation of other Cabinet members as well."[7]

In addition to the decision-making processes within the MOE and within the President's Cabinet, a number of other groups play significant roles in the decision-making process. Such groups as CERI and KIRBS (Korean Institute of Research in the Behavioral Sciences) provide technical information and recommendations regarding educational issues and problems. Similarly, the teachers' federation (KFEA--Korean Federation of Education Association), the HEC--(Higher Education Council), the CLEP, KIST--(Korean Institute of Science and Technology), and other groups all contribute in-put in various ways and in varying degrees, depending on the problems, the issues, and on the political configuration at the time.

It is perhaps helpful to have a model of a "change loop" that shows the various groups, their interdependence, and their relationships. Those who would promote significant major changes in Korean formal education would necessarily have to operate from one point to another in the model

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[7] CERI-COMP., p. 86.

In the change loop, information flow is provided for and distinguished from open command which is signified by the words "Orders" and from less visible command signified by the word "Directives." (See Chart A-3.)

In the case of official autonomous groups such as the Committee on Long Range Educational Planning, the Higher Education Committee, the President's Economic and Science Committee, and the Office of Labour Affairs, information flow is depicted by an antenna that may be thought of as both general and beamed. A general pulse-taking sensor, it would pick up "traffic" in the loop, but also as a beamed information gatherer that seeks out desired information for special purposes: e.g., manpower studies.

The Office of Labour Affairs (OLA) is responsible for the considerable factory-related vocational educational programs, and this puts the OLA into the total education picture in Korea.

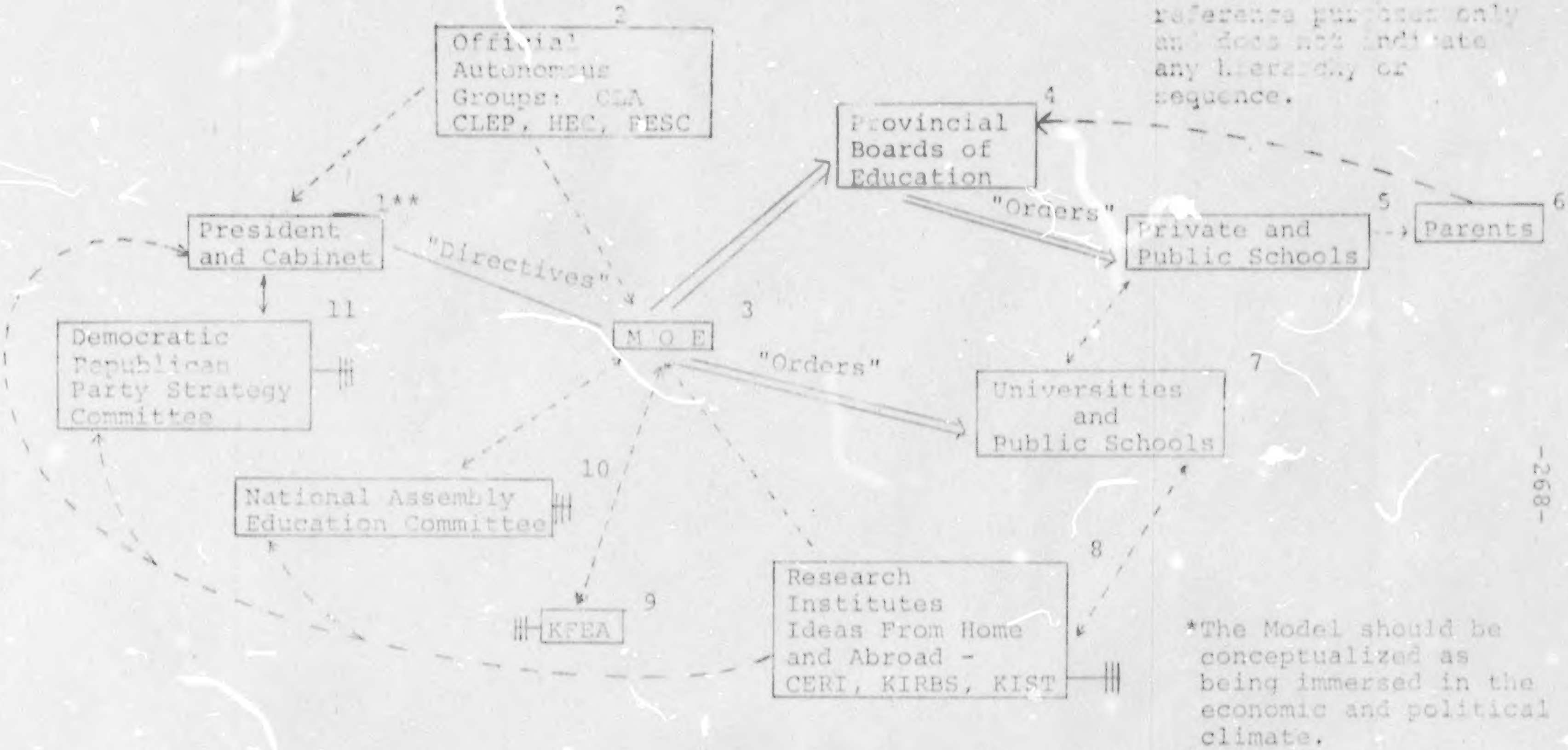
The change loop schematic is quite over-simplified; it is an attempt to depict a non-formal system that is adapted to present day conditions and realities and in this regard may differ from the "way things are supposed to be."

The essence of the change loop as shown is that changes in the system are likely to come about most effectively and most quickly through decisions for action taken in 1, 10, 11, 3, or 2. Nevertheless, one cannot ignore the potential impact that 7, 8, 9 could have separately or together if they were to signal to 10, 11, 1 or/and 3 educational imperatives that were clear, sound, and rooted in reality.

Designs for implementing change will have to take into consideration the ways of reaching the various components of the loop so that not only will information become available for stimulation and study directed toward decision-making, but also in order that the sequence and timing may be planned for maximum effect.

A detailed study of the MOE's administrative functions was carried out in 1966 by the Central Education's Research Institute. Many valuable recommendations were made, and a number of these have been carried out. For a detailed analysis of Korean educational administration the reader is referred to CERI's detailed study, cited here as "CERI-COMP."

Chart A-3. ROK EDUCATION DECISION-MAKING CHANGE LOOP: A MODEL*


2
Official Autonomous Groups: OLA CLEP, HEC, PESC
1**
President and Cabinet
"Directives"
11
Democratic Republican Party Strategy Committee
3
M O E
4
Provincial Boards of Education
"Orders"
5
Private and Public Schools
6
Parents
"Orders"
7
Universities and Public Schools
10
National Assembly Education Committee
9
KFEA
8
Research Institutes Ideas From Home and Abroad - CERI, KIRBS, KIST

**Numeration is for reference purposes only and does not indicate any hierarchy or sequence.

*The Model should be conceptualized as being immersed in the economic and political climate.

KEY: ⟹ Orders and Commands

⟶ "Directives" (Written/Oral-Formal/Informal)

- - - -> Information and Advice

——‖| (Antenna for information and data collection)

PESC - President's Economic and Science Committee
HEC - Higher Education Council
OLA - Office of Labour Affairs
CLEP - Committee on Long Range Educational Planning
CERI - Central Education Research Institute
KIRBS- Korean Institute of Research in the Behavioral Sciences
KIST - Korean Institute of Science and Technology
KFEA - Korean Federation of Education Association

(Chart by S. R. Grant)

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II. The Boards of Education

Returning to the chain of command between the MOE and the schools, it is important to discuss the Boards of Education.

Each of the eleven provinces of South Korea is considered an administrative unit of the Ministry of Education, with Seoul and Pusan taken as special units.

A seven-man Board of Education is responsible for the administration of the school program in each of these provinces. For each province, five of the board members are selected from a list of twenty-five persons nominated by the governor of the province for consideration and selection by the Minister of Education. The five persons selected by the Minister, are then appointed to serve a four-year term *ad honorem*. Usually, the five men are prominent in the business and professional circles of the province, and represent the various geographical areas within the province. The provincial governor is an *ex officio* member of the Board, and when present chairs the meeting.

Once the Board has been appointed, it selects the superintendent for the province, whose name, before appointment, is reviewed by the President. The superintendent is the professional officer, is salaried, and becomes the executive for the Board in meeting the responsibility for running the schools. Appointed for a four-year term, the superintendent is a Board member but is also responsible to the Board. He may be removed (as happens very rarely) only by the Minister of Education.

Educational policy is made by the Ministry of Education, and the Ministry also spells out the guidelines for curriculum, tuition fees, parent association fees and teacher qualifications. The Board of Education, however, implements policy, acts as an executive body and has control over local budget allocations. The Board of Education also exercises controls over the private schools, even to the extent of supervising and monitoring their curricular offerings and the fees they charge.

The Board meetings vary in frequency--from weekly meetings to monthly meetings. The superintendent's staff usually attend the meetings, and though the public is not usually present, sometimes the press is. Often, the governor is unable to attend the Board meetings, but some governors take special interest in education and attend most of the meetings.

The duties of the Board of Education as outlined in the general education law follow:[8]

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[8] Korean Legal Center. *Laws of the Republic of Korea*. Seoul: The Center, 1969. pp. 1346-1393.

Article 24. (Matters to be Deliberated). Each education board or education chief shall be in charge of the affairs concerning education and arts and science of its respective local autonomous body, the contents of which are as follows:

1. Matters concerning submission of drafts for legislation, amendment or abolition of regulations regarding education and arts and science;
2. Matters concerning establishment, transfer or abolition of schools and other educational institutions;
3. Matters concerning districts of attending schools;
4. Matters concerning purification of school surroundings;
5. Matters concerning promotion of social education, culture and arts and science;
6. Matters concerning physical education in schools and for the general public;
7. Matters concerning Confucian schools and Buddhist temples;
8. Matters concerning the contents of education;
9. Matters concerning facilities for education and arts and sciences, and other education apparatuses;
10. Matters concerning budget and settlement of accounts regarding education and arts and sciences;
11. Matters concerning acquisition and disposition of properties regarding schools and other matters concerning education;
12. Matters concerning imposition of taxes, special dues, fees, rentals or allotment of sharing of expenses regarding education;
13. Matters concerning prime properties and reserve funds in connection with education and arts and science;
14. Matters concerning issuance of bonds or loans, with regard to education and arts and science;
15. Matters concerning sharing of liabilities, in addition to budget relation to education and arts and science;
16. Matters concerning formulation and execution of budget for education and arts and science;
17. Matters concerning legislation, amendment and abolition of regulations concerning education and arts and science; and

18. Other matters delegated to the education board and matters concerning education and arts and science within the district of the competent local autonomous body.

Although at first glance it would seem that MOE as a policy maker has the major force in education, in reality the Boards of Education as the on-the-spot implementers of policy in day-by-day activities wield great power in the provinces. In programs of experimentation and in pilot or demonstration projects, the approval and participation of the Boards would be essential for any local action and success.

IV. The School Year and School and Class Size:

Korean children start their formal public school attendance at age six or seven. The school year is divided into two terms as follows: March 1 through July 25, and September 1 through February 28. Children who are six are admitted to the school year if their birthdays fall between January 1 and March 1, otherwise they will be admitted the following March.

In the elementary and secondary schools, besides the usual one-day holidays,[9] there are two major vacation periods: 25 December through January 31. The school year varies from 230 days at the primary level to approximately 200 days at the secondary level.

As shown previously, primary education consists of six years given in grades one through six. There was only one public school Kindergarten reported officially in 1969, but 459 Kindergartens reported for private schools. In the first three grades, boys and girls are grouped together. In grades three through six, the boys and girls are separated into different rooms whenever numbers are sufficient to warrant this. In middle school and high school, boys and girls are educated in all-girl or all-boy schools. There is a wide variation in administrative practice with respect to assigning teachers to remain with children year after year for the entire primary school experience, and usually a child will have three or four different teachers during his elementary school career.

Theoretically, and as a matter of MOE policy, organization for instruction at all school levels is supposed to be heterogeneous, but homogeneous grouping based on teacher judgment and on academic achievement is carried out, but not blatantly.

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[9] One day Korean holidays are: January 1, March 1, April 5, June 6, July 17, August 15, October 3, 9, 24, and December 25.

Reasons given for the policy of heterogeneous grouping vary from claims that it is "more democratic" to the wish not to offend the less able child.

In the primary schools, promotion from one grade to another is automatic except for long-term absentees. In some instances, there are dropouts and these occur mainly in rural areas and chiefly for financial reasons. The average annual dropout rate in first grade is 3.58 percent, while that in other grades is approximately two percent. This rate varies from region to region, with lower rates in the big cities.

Korean primary schools are organized into geographical attendance districts, and most primary schools have from six to 42 classes per school. More than half of the total of 5,705 schools are included in the 12-29 room-per-building bracket. The tendency toward large school plants at the primary school level in Korea is even more clearly shown when one notes that 82 schools were reported as having 66 rooms or more, and six of these schools were reported as having 100 rooms or more. In rural areas, there are small branch schools with only three to four classrooms.

Viewed from a pupil population aspect, 1,616 primary schools had a school population of more than 1,000 students per building and 25 schools were reported as having more than 7,000 pupils per building.[10]

With respect to class size, the reported range was 20 to 101 students per class, with the mode at 24,682 classrooms and a class size of 61-70 students.[11]

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[10] MOE. Statistic Yearbook of Education: 1969. Seoul, Korea: Oct. 1969, p. 126-127.

[11] Ibid.

The following extract shows the enrollment figures for public primary schools

Table 1

Number of classes by number of pupils per class

No. of students per class	Total	20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101
	88,063	218	801	2,725	10,908	22,970	24,682	15,299	9,573	839	48

Source: 1969 Statistic Yearbook of Education MOE, Seoul, p. 134.

There is some use of double or triple shifts among the elementary schools, with 2,988 schools reporting more than a single shift.[12] Most of the double shifting occurs in the first three grades and tapers off sharply thereafter.

With respect to students in the primary schools, from an administrative point of view the chief characteristics are large school population per building and great population density per classroom.

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[12] Ibid., p. 132.

School visits confirmed this: space was at a premium, and when the classrooms were full, there was little peripheral space and almost no passing space between rows and seats. In most cases, "fixed-type" row-upon-row seating was used, though the school benches and desks were not fastened to the floor. In a few rooms, especially reading rooms in libraries, desks were sometimes grouped into small group face-to-face arrangements.

Even under their high density conditions, the order and decorum of the students are remarkably good by any standards.

In brief, then, Korean schools at the primary and secondary levels show great population density, a tendency toward very large plants, and a teacher-pupil ratio of approximately 1:66.

The crucial problem of space is concisely outlined by Sederberg in an interim report made in May 1970.[13] In that report he recommended a three-stage plant construction program based on need, replacement and improvement. He also recommended double shifting, transfer of all vocational education to the Office of Labour, an inventory of space and plants, and the development of space criteria.

V. The Parent Associations and Student Fees

Although education in Korean primary schools is "free", it is expected that the parents will contribute voluntarily through the PTA to the school for each child enrolled in school. Throughout the nation this contribution averages W 400 per child per year. (310 W = $1 U.S. Dollar--August, 1970). now 373 W = 1 $

As an operating system, however, these voluntary fees are really higher and are spelled out by the Ministry of Education. The ministry has established, first of all, various categories of schools, such as schools in metropolitan areas like Seoul and Pusan, schools in large cities such as provincial capitals, schools in small rural towns and schools in remote areas. Each one of these categories has its own fee schedule.

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[13] Charles H. Sederberg, Planning for Utilization and Development of School Plant Facilities in Korea. Interim Report (MUCIA) USIAID. Korea, May 1970 (Mimeographed pp. 60-62.

Each fee schedule, differing from category to category, has a sliding scale that is a function of the family's ability to pay. The schedule permits about 20 percent of the children to be exempt from the PTA fee, and the other children pay fees on a ascending scale. For example, Table II shows the scale for big city category primary schools:

Table II

Sample of PTA Contribution Guidelines for Major Cities Based on Class Size of 70 Children* (Monthly)

"Ability to pay"	No. of children in the class	Monthly Maximum Fee (W)	Total collected
A	14	--	--
B	7	150	1,050
C	14	300	4,200
D	21	450	9,400
E	14	600	8,400
	70		23,050 Month

*Source: "PTA Guidelines of Primary and Secondary Schools" MOE, Seoul, 1970, p. 19.

Another rural area category is more simple:

Table III

Sample of PTA Contribution Guidelines for Rural Primary Schools Based on Class Size of 60 Children* (Monthly)

"Ability to pay"	Estimated No. of Children	Monthly Maximum Fee (W)	Total Collected
A	18	--	--
B	18	100	1,800
C	24	180	4,320
	60		6,120 Month

*Source: Ibid., p. 21.

Thus, Korean parents may pay on a scale from nothing to 600 W per year for each child in primary school. The classroom teacher determines the family's ability to pay, but the criteria for judging ability-to-pay are subjective and arbitrary.[14]

The same system for PTA contributions is operative at the middle and high school levels, but the fees are higher. Parents of children in secondary schools also pay other additional fees. When a student enters a secondary school, he pays a one-time registration fee of W 1,000.

Each year that he attends school he pays an average approximate 12,500 W tuition fee, payable quarterly. These are "required" fees that all must pay.

Above and beyond these required fees, parents of students at the secondary level also pay a PTA voluntary contribution, and this is worked out in the same way as at the primary school level, based on the categories of schools and on the ranking of students by ability to pay. The PTA fees average approximately W 1,500 annually, and are payable quarterly. Students also pay a student government fee (W 1,000) and an experiment and practice fee (average 1,600 W).

The following is a summary of the fees required for students at the secondary level:

Table IV

Sample Fees Payable per Child at Secondary School Level, e. g. , Big City, High Socio-Economic School

Type of Fee	Middle School Fee	High School Fee
1. Entrance Registration (one time)	W 1,600	W 1,900
2. Tuition Fee (Annual) Payable quarterly)	14,000	16,000
3. Student Gov't (Annual)	1,600	2,400
4. Experimental and Practice Fee (Annual)	1,600	2,400
5. *PTA Fee (Annual)	3,500	3,500

*Voluntary fee as per MOE schedule. Nos. 3,4,5, remain in school coffers; Nos. 1,2, are sent to BD. of Ed. (Source: CERI)

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[14] Teacher Interviews, 7 August 1970.

Table V

Sample Fees Payable per Child at Secondary School Level, e.g., Rural School

Type of Fee	Middle School Fee	High School Fee
1. Entrance Registration (one time)	W 1,200	W 1,400
2. Tuition fee (Annual) (Payable Quarterly)	11,200	12,800
3. Student Government (annual)	1,000	1,700
4. Experimental and Practice Fee (Annual)	800	1,200
5. *PTA Fee (Annual)	1,000	1,500

*Voluntary fee as per MOE schedule: Fees No. 1 and 2 are sent to the provincial Board of Education; Fees Nos. 3,4,5 remain in school coffers. (Source: CERI)

The figures reported in tables IV and V give an idea of the range of fees collected at the secondary level, and the amounts shown here tend to be depressed, for well informed sources allege that in many instances higher fees tend to be collected.

Also, it should be borne in mind that students must pay for textbooks (W 3,500 ±/annually) and for summer and winter uniforms (W 3,000 ±/year).

Thus, the cost of schooling for parents of a child at the secondary level will vary from W 33,700 per year per child in a first class high school in a big city to W 21,700 per year per child in a rural middle school, an average of W 27,700 per year per child nationwide.

Precise figures are difficult to obtain for, as mentioned previously, practice departs from policy and actual payments are allegedly often higher than the official figures. On the other hand, if one were to include in the average students who are exempt from PTA fee payments (about 20 percent of the enrolled population), then the annual average per capita figure would decrease.

With respect to the ways in which PTA funds are used and referring to TABLE II showing a typical primary school PTA payment scale, the MOE guidelines show the following expenditures for the stated case:

Table VI

Typical Expenditures of PTA fees for 70-Student Classroom in a Major City Primary School (Monthly)

Item	Expenditure (Month)	Percent
Student Welfare	W 700	3.1
Research Allowance (Teacher Salary Supplement)	13,000	56.2
Classroom Maintenance	4,000	17.3
Other	5,400	23.4
	23,100	100.0

Source: "PTA Guidelines of Primary and Secondary Schools" MOE, Seoul, 1970, p. 19.

In summary, the importance of both the required and voluntary fees paid by parents for the education of their children in the Korean public schools is considerable. As a factor in the support of the schools, parent payments provide a major portion of the budget, including important and substantial supplements to teacher salaries.

As a socio-economic factor for the parents, fee payments place a great strain on many families. That the drive for schooling for Korean children is so strong despite the cost directly paid by parents, bespeaks the tremendous social demand for education among the people of Korea.

There are also certain psychological problems and philosophical issues that arise from the collection of fees. Among the former are the various feelings generated among those who pay more and those who pay less; among the latter is the issue of the propriety of fees for education in democratically and technologically oriented societies that supposedly draw primarily upon human resource talent and ability, and depend to a lesser degree on family and social background. These problems and issues must be viewed against the backdrop of the nation's economic constraints and the ability to underwrite the costs now paid by the parents.

These problems and issues were reviewed by the Ministry of Education, and in February 1970, the "improved" system described in the foregoing was introduced. Korean officials maintain that the PTA fee system is a temporary measure only.

Prior to February 1970, the PTA fees collected were lower but they were collected along with the tuition money as if they were part of tuition; only children of the military, the police, and those in education were exempt from the PTA fee as contrasted to the 15 percent across the board who may now be exempt for economic reasons. Now, the fees are higher and the teachers receive more as a salary supplement. But this "splitting off" of the PTA fees from tuition and the formalization of PTA fees by the Ministry of Education has not been popular with teachers. They prefer less central control and more flexibility.

PTA fees are a major factor in the support of the Korean schools; parents, teachers and the government--each has looked at this practice from a self-interest and from a general point of view. It is clear that the payment of PTA fees is not a closed issue. Any modification of this system will have profound social and economic effects within and without the Korean educational system. Social, economic, political and cultural factors must play an important part in considering even slight modifications in such a practice.

VI. STUDENT EXAMINATIONS

Student evaluation is carried out chiefly through the use of teacher-made pencil-and-paper tests. These are given frequently at both the primary and secondary levels, so that parents are able to receive monthly reports on pupil progress. Some standardized tests are employed, but their use is minimal.

Examinations, however, play a prominent part in the student selection process from level to level. Until 1968, there were entrance examinations to determine who would enter the middle schools. At present, there are major examinations for entrance into the high schools and into the colleges and universities. Furthermore, the Ministry of Education has just instituted uniform examinations for entrance in the universities, so that starting in 1968 the student must first qualify on a national uniform examination before being allowed to take the examination for entrance into a specific university.

These entrance-to-higher-level examinations are formidable barriers that purport to measure achievement in the curricular content of three years of high school by means of a one-day, seven-hour exam. As such, they rely heavily on recall and memory.

The ills of major entrance examination systems are well known: educational programs become shaped around the examinations, teachers teach for the exams, special private tutoring institutes spring up, and the meaning of education in terms of inquiry, enjoyment, and application to the real world becomes diminished. Such examinations also exact their tolls in terms of student physical and mental health. Yet, the ills perhaps lie not in the use of an examination as an assessment tool, but rather in the kind of examination system that is devised and the overtones that educational leaders permit it to develop in its application through the years.

In the case of Korea, as in other countries, the examination system has been viewed by educators as something evil that must be modified or abolished, just as they have done with the entrance examinations for the middle schools.

Korea needs more sophisticated assessment instruments to assist in selecting the students who may profit most from various kinds of educational programs in an economy of educational scarcity. Korean educators are dissatisfied with their present examination systems and tend to talk in terms of abolition rather than in terms of innovation and modification. Imagination and technological innovation could provide fresh insights into national level assessment programs. Such innovations require careful planning and consideration, and in Korea many vested interests must be overcome, since services and special academies for preparing students to take examinations will oppose abolition or modification of the practices on which they thrive.

VII. The Schools

Team members visited numerous schools during their eleven-week stay in Korea. To ensure as wide a range as possible, all kinds and levels of schools in various parts of the country were visited.

The visits were arranged by CERI through the Ministry of Education. As the visits mounted in number, team members became more selective and specified that they wished to visit a "very good school" or a "very poor school" in such and such locale.

Announced and pre-planned school visits can be very misleading to the visitor. School lore is filled with humorous accounts of the superintendent's or VIP'S visit to the local schoolhouse. Still, experience is a great boon and data became available whether volunteered openly or achieved unobtrusively.

The schools from place to place were remarkably homogeneous and the ritual and protocol of a visit--starting with a greeting at the door, through tea with the principal in his office and a statistical review of the school, through the round of visits or walk-through--to the final farewells were strikingly similar.

The trips to visit schools outside Seoul were illuminating beyond just the confines of the schools, and data were gathered on the social, cultural and economic features of the area as well. These are reported briefly in the four major trips recorded here.

Aside from the general conclusions reached and to be reported briefly here, the trips offered excellent opportunities to meet high administrative and political officials who seemed willing and open in discussing problems and issues in Korean education.

Notes on a Visit to the Kyung Dong High School, Seoul, Korea, on 7 July 1970, 2:30 - 4:30 P.M.

GENERAL

The Kyung Dong H. S. is an academic high school on the borderline between "first category" and "second category" schools. The first category schools are those which are known for their long history of getting a high percentage of their graduates into the universities. The second category schools receive students who were unable to pass the entrance examinations to the first category schools but who were able to pass second-category-school examinations. Each school gives its own entrance examination and selects the students who will fill the enrollment vacancies allocated by the Ministry of Education.

In 1970, the opening enrollment was approximately 570 male students. At present, the principal of the Kyung Dong H. S. must decide whether he will include his school in the ranks of the first Category Schools or whether he will remain again as the leading school in the second Category Schools. As the ranking is "self-selecting", it is primarily a question of pride. There may be some additional benefits to the teaching staff, however, depending on the contributions of funds by the Parents' Association. Ninety percent of the students who enter graduate, and 95 percent of the graduates go to college or universities.

PERSONNEL

The Kyung Dong H. S. is housed in a large four story, ten-year old building in the northern part of Seoul. It houses grades 10, 11, 12, and the 1930 male students come from all over Seoul. The staff consists of fifty full-time teachers, organized into the usual specialties of foreign languages, math, science, Korean language, etc.

In addition to the full-time teaching staff, other personnel in the building are: 1 principal, 1 vice-principal, 1 senior teacher, 5 secretary-accountants, 1 guidance teacher (assisted by 3 other teachers), 1 audio-visual teacher, 1 librarian, 5 military training persons and the janitors.

THE SCHOOL DAY

The teachers and students arrive at 7:30 A.M. and leave at 5:00 P.M., with an hour for lunch. Most students and teachers bring their own lunch. Because of the early school-reporting hour, many students--especially those who must travel from far away--skip breakfast.

In general, the school day is organized into 50-minute periods, starting at 8:00 A.M. Usually, the students remain in the rooms while the teachers rotate to teach the different subjects; in the case of special subjects requiring special facilities, such as chemistry, music or art, the students move to the special labs and rooms. Classes are held 5½ days per week, Mondays through Saturdays.

Teachers must teach twenty hours per week, but many of them donate extra hours to assure the success of their students in the entrance examinations to the universities.

COST TO STUDENTS

Parents pay W 6,000 every three months for each student enrolled; children of teachers receive a discount. Textbooks cost approximately W 3,000 per year and the cap-shirt-and-trouser uniforms (one for the summer and one for the winter) cost approximately W 4,000 per year. This totals about W 27,000 per year of contributions by the parents. The monies are used to supplement teachers' incomes (for their extra hours) and to buy materials and equipment.

1/5
$70

EQUIPMENT

The school was crowded but clean. There were approximately sixty students per room, filling the room completely; separate desks and chairs were end-to-end in the rooms, leaving little or no aisle space. Rooms had adequate fenestration and there were blackboards and a few charts.

The plant had electricity, and the modest lighting system was functional but was not often in use during the visit (a clear, sunny afternoon).

A 7,000 volume library and reading room were in a separate forty-year old building on the other side of the playing field.

In the main building there was an audiovisual room which was in use at the time of the visit. Personnel from the military academy were showing a film.

There was also a lecture amphitheater and three rooms with individual study carrels, line by line.

The school had the following A-V equipment: two 16 mm projectors, 3 slide projectors, 2 overhead projectors, 2 TV sets, 1 opaque projector and a 60-station language laboratory.

The wooden desks and chairs were of very poor design and in very poor condition. Desks and chairs seemed too small for the students, and the desk tops were deeply gouged from differential wear and use. Desks and chairs were so packed into the rooms that "passing space" was inadequate and was hazardous from any emergency evacuation criterion.

INNOVATION AND INSTRUCTION

Although the school had two TV sets, they were used only for special occasions ,such as the inauguration ceremony of the new Seoul-Pusan highway, and not for any regular ETV program.

According to the principal, about 30 percent of the students had TV at home, and about 90 percent of the teachers had TV at home.

Regarding programmed instruction, the teachers had not worked with this technique.

Recently, the school published a first edition of an English-language four-page newspaper.

ASPIRATIONS

When asked what three things he would want most for his school if he could have his three wishes, the principal replied:

1. To enhance the school's standing, he would want better teachers and better students.
2. He would like to secure good instructional materials and have quick and easy access to them.
3. He would like to secure benefits for his students, such as improved lunch facilities, improved transportation to school, and less pressure and tension.

When asked what he liked most and what he would like most to change in Korean education, the principal replied:

1. He liked the tremendous drive and enthusiasm for Korean education on the part of parents and students. Parents make enormous economic sacrifices to gain further education for their children.
2. He disliked the present "awful" exam-oriented educational system. Students cram for the three years to be able to pass the university entrance examinations. It is bad for their physical and mental health. Education, thus, consists of memorizing information and formulae. Much of what is learned is unrelated to real life and is useless except for the purposes of the examination. High School education must be more realistic, but one must change the exam system to bring this about, he said.

GENERAL

The principal was new (six months at this school), and it was clear he was reassessing the role of his new school. An experienced educator--about forty years old--he and his staff assistants seemed well organized and knowledgeable about their school and Korean education.

From the point of view of possibilities for innovation, the main problems in this situation would be finding sufficient classroom space and finding teacher-training time for teacher improvement. Underlying both of these is the examination-preparation pressure. In this regard, innovation would either have to be shown to be more effective and efficient in serving the stated examination goals, or those goals would have to be modified in some way to free students and teachers from the implacable pressure of the exam system. With respect to the latter, modification of the exam-preparatory function would at once free teachers and pupils from real and implied penalties in not following exam preparatory activities and would also allow teachers to make the educational program more realistic in terms of the students' lives and the nation's socio-economic goals.

Summary of the findings, impressions and thoughts resulting from a trip and school visits in Daejon and Kongju, Chungnam Province, 13 and 14 July 1970

BACKGROUND

Daejon is a provincial capital (population: 400,000). Kongju is a rural town (population: 40,000) in the heart of an agricultural area.

The purpose of our visit was to speak with local officials and visit schools outside of the Seoul area in order to get a more balanced picture of the educational structure in Korea.

The visiting group of team members met with the Bureau Head and Superintendent of the Board of Education of the Province who provided the group with an interpreter and guide for the two days. This made it possible to make twelve visits of which eight were selected schools in the area. Mr. Kim Chae Bom of CERI was an invaluable guide and additional interpreter and had made the advance preparations by phone.

GENERAL FINDINGS, IMPRESSIONS

1. Occupancy

Every school visited was packed tightly with children, furniture, and equipment. The group saw no fewer than 70 children per room; in some cases there were 75 or 80 children in rooms that in the U.S. would hold 35 persons maximum. Little or no aisle space was provided, and little or no perimeter space was available except at the front: 2 meters, and at the rear: 1 meter. In some cases large rooms had been made into two rooms by the use of partitions. The room then held 120 persons--60 in each sub-division. The schools, then, are characterized by high density of occupancy and conversely they have little non-utilized space.

2. The Students

Despite this high density, the group observed great control, order, and neatness of utilization. This order was not forced, and it was clear that the children at the primary school and middle school levels were voluntarily giving their unquestioned obedience and/or cooperation. There seemed to be greater motion and commotion at the high school level but not anything that could be termed "out of order."

3. Classroom Appearance

Most of the classrooms had ample air flow and some natural light; this was enhanced by sets of windows on both the exterior wall and on the corridor-interior wall. Despite the provision for natural light, many rooms were so dull and dark that photographs could not be taken at an f 3.5 / 1/30 setting with ASA 400 film. Nevertheless, classroom work was being carried out without apparent concern or discomfort on the part of the students. In some schools there was no electricity; in others, the electrical installations were meager. Nowhere did we see electric lights in use. Teacher-made instructional materials such as charts, model clocks, calendars, and other aids and devices were in abundance around the rooms. Plants, art work, and general neatness gave most of the rooms a pleasant tone despite the crowded conditions. It was obvious that the teachers had been using the instructional aids available to them.

4. The Teachers

Most of the teachers were young, probably under 35 years of age. The principals were older: 40-60. In most cases, the group observed teacher-directed lessons in progress, with teachers reciting, asking questions, or working at the chalkboard. The students were alert, attentive. Teachers expected and got unquestioned obedience, but there was no indication that special measures were required for this: good student behavior seemed to be taken for granted, especially at the primary and middle school levels. In the departmentalized secondary program, teachers moved from room to room to meet their subject classes. During these times, students were in the hallways, visiting one another and taking rest breaks. Normal teenage noise and some horse-play were observed in these instances, and the appearance of the visiting group along with the principal did not noticeably affect student behavior. In schools visited in the late afternoon, the group saw teachers working with individual students, or with small groups in what were termed "tutoring" sessions. The teachers' room was more of a work-office area than a lounge area; teachers were at desks, reading, writing, smoking.

5. Physical Plant

Schools varied in size, design and age. Many Japanese-built schools (pre 1945) were still in full use. The schools were clean but showed serious signs of wear. Space was everywhere inadequate by U. S. standards, and the lavatory facilities by U. S. standards were poorly maintained. As mentioned previously, electrical installations were minimal. Heat in winter is provided by small pot-bellied stoves, which are placed in each room. The stoves and their pipes are removed for the summer.

Desks and chairs for students were mostly inadequate: they were too small, poorly designed, often broken, and desk tops were often deeply gouged.

Most schools had adjacent land that was used for play areas (baseball fields, etc.) or for recreational gardens where students could go to sit and talk, after class hours.

6. Sample Comments

During each visit, the group had ample time to chat with the principal, vice principal, and sometimes with teachers. They were also given varied and detailed statistical data, usually prepared by each school's staff in small booklets or brochures. As a result of these conversations, the following points arose:

(1) Teacher interest in teaching as a career seems to be declining with Korea's economic growth. Teachers are leaving teaching, fewer "good" people are going into teaching, and fewer men are entering the profession, we were told.

(2) Although curriculum is determined nationally by the MOE in Seoul, schools do have flexibility in determining how and with what teaching is carried out. This depends on each principal. Textbooks must be from an approved list. No regional adaptations are permitted in the national curriculum.

(3) The PTA's contribute money to the schools. The maximum amount that may be required is determined by the MOE in Seoul. At the high school level, for example, PTA's provided half again as much money as was allocated by the MOE for the school. The PTA money was used for salaries and equipment but mostly for salary supplements. There was vagueness and ambiguity in discussing these funds, and some of this was due in part to the lack of clear definitions regarding categories of money.

(4) Parent support of the schools is complete. Schooling is viewed as one of the highest priorities for children and there is strong support by parents of the school in in every way. Parents leave to the school the determination of content and methods of instructions.

(5) Evaluation of student progress is chiefly carried out by means of pencil-and-paper teacher-made tests. Reports are sent home monthly to parents. Teachers try to make one home visit per year.

(6) The school day starts at 8:30 A.M. and lasts until 5:00 P.M. For young children it is less. One hour is provided for lunch, and most students bring their own lunch.

(7) The exam system is looked upon with disfavor: "It hurts the students' health, for they are under constant pressure to pass exams for admission to high school and to the university." The abolition of the exam for entrance to middle school (1968) is looked upon quite favorably.

(8) Teacher meetings are held regularly, usually every morning for 15-30 minutes. Working relationships seemed to be good and seemed to be benevolent and paternalistic on the part of the school leadership.

(9) Double shifting is looked upon as undesirable and expensive, with some arguing against it on the grounds that only children who attend the morning session will "be fresh and eager to learn, while the others will tire on the streets in the morning and not be able to learn during the afternoons."

(10) No homogeneous grouping is permitted by the Board of Education. Children must be grouped heterogeneously.

(11) There are few dropouts, with the trace percentage of those who do so, for health reasons. Between public and private schools, enrollment is virtually 100 percent of the school-age cohort at the primary and middle school levels.

(12) There is only minimal use of E-TV in the schools. Several of the schools visited had a TV set, but none reported systematic use of TV in instruction. Signal weakness, scheduling problems, and lack of equipment were cited as the major reasons for not making greater use of TV. As some schools did not have electricity, the question did not arise.

(13) With respect to change and innovation, it was felt that after such a hectic period of quantitative growth a "rest period" was needed. The most desired change sought was a reduction in student-teacher ratios. At the same time, there was interest in innovation, but significant innovation was discounted at once because of the implied costs. Change was thought of in rather traditional terms and along improved ratio and quantitative lines. Generally, there was great openness to change and apparent organizational ability to carry it out, but change was thought of in terms of "more of the same".

(14) Concern was expressed at the disintegrative effects of the "bad" aspects of Westernization--modernization. Films with violence and immorality were cited as examples. There was a concern for preserving cultural integrity in the face of the pace of economic growth that seemed to be having multiple and unpredictable effects on society and on children in school.

FINAL IMPRESSION

As much as can be gathered from walks through schools and talks with school personnel, the group sensed that the staffs were interested, dedicated, and professional in their orientation to their work. They also felt that the effectiveness and efficiency of the school programs were greatest at the elementary school level and diminished as one went higher up the educational ladder.

Two major problems, at least, seemed to concern the people with whom the group spoke: first, was the new broader range of student body in the middle school as a result of the abolition of the middle school entrance examinations; second, was the examination system itself as a controlling factor in the higher levels of the system.

With respect to the former, new adjustments had to be made at the middle school level to cope with the increased number and with the new full range of student achievement (under and over achievement). Regarding the latter, the examinations were cited as one of the major reasons for rigidity of curricular programs and for the emphasis on memoriter education.

Report on the Trip to Kangnung and School Visits There

On Thursday and Friday 23, 24, July, a group of team members travelled to Kangnung, a city of 70,600 inhabitants, located on Korea's eastern coast at approximately the same latitude as Seoul. The Korean Air Lines flight took less than an hour in a twin-engine propeller aircraft. The group was met at the airport by representatives of the Office of the City Superintendent, as had been arranged by Mr. Kim Oki, the companion and guide from CERI.

The purpose of the trip was to determine differences, if any, between the schools and school administration in the seacoast region in comparison with Seoul and other inland regions such as those in Daejon, Kongju, and Chunchon.

Kangnung depends administratively upon Chunchon, the capital of Kangwon Province, in which Kangnung is located; however, because of the rugged terrain between Chunchon and Kangnung, transportation between the two cities is poor. Kangnung is primarily an agricultural and tourist region. Although Kangnung is located on the Sea of Japan, its climate does not differ appreciably from that of the rest of Korea.

Kangnung has ten primary schools which are under the jurisdiction of the City Superintendent. The five middle schools and the seven high schools are under the jurisdiction of the Board of Education in Chunchon. There are 11,788 students and 204 teachers in 182 classrooms in Kangnung. There are also private schools, one of them a primary school run by a Seventh Day Adventist group.

There is no TV, commercial or otherwise, in Kangnung and it was said that there was no TV along the entire eastern coast of Korea. Plans exist to bring TV into Kangnung in the near future.

In Kangnung, five visits were made as follows: a meeting with the City Superintendent, and school visits to a primary school, a combination boys' middle and high school, and a visit to an Agricultural and Industrial High School. This report is on only the highlights of these visits. The visits took place on a hot summer day when the mercury stood at the mid and upper 90's.

The Primary School

Consisting of 3,056 pupils and 47 teachers in 43 classes, this school did not differ greatly from other elementary schools which had been visited. There were the characteristic crowded conditions, poor equipment, and generous stock of teacher-made materials on display and in use.

According to the principal, children usually are assigned an experienced, expert teacher in first grade. Then, they go to second grade with another teacher and generally stay with that teacher in grades two, three, and four. They usually have another teacher again in grades five and six. Thus, there is a combination of teacher use that, according to the principal, combines teaching expertise with the need to have teachers who know their children.

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The principal was frank and thoughtful in responding to probing general questions on Korean education, e. g. "Could you characterize what you think will be the problems and opportunities in Korean primary education in the 1970's?" , as follows:

(1) "Quantity in Korean education has increased, but quality has decreased. We have no audiovisual equipment, not enough playground area."

(2) "The planned withdrawal of U. S. Forces--if carried out--may mean a decrease in the national budget for education, because the armed forces will require increased funding to take up the gap."

(3) "The quality of teachers is declining, because good high school graduates don't go to the teacher colleges any longer. So, the quality of education may also decrease."

(4) "At present the slack in teacher salaries is taken up through the use of PTA funds. In the big cities this isn't so bad, because only about 70 percent of what is collected goes for salaries, but in remote areas almost all these funds go for salaries.

(5) "Why can't we start teacher college education by finding students in the middle schools who are interested in being primary school teachers. We could then give them a special five-year teacher education program right after middle school, instead of a regular academic pre-university program. This would produce a higher quality teacher for the primary school--better than the two-year teacher college graduate and better than the liberal arts graduate who goes into teaching because he can't find any other job."

Combination Middle and High Schools

Built in 1951, this middle school houses 24 classrooms with 1,414 students and 34 teachers. In 1971, because of the policy of free entry without examination into middle school, this middle school will increase class size from 60 to 70. There are plans to build a new high school on the other side of town, and when this is done, the high school will move out and leave more room for this middle school.

The facilities had electric wiring, but it did not seem functional, as there were no bulbs in the sockets, and a Peace Corps Volunteer said he had been told there was no current.

The school receives W1,036,400 from the Province in its annual budget and W 13,052,500 from the PTA. Parents pay a W 6,480 tuition fee, a W 1,200 student fee, a W 1,000 expense fee, and W 10,200 per year per student as PTA contribution. This totals W 18,880 minimum per child per year (W 312 = $1.00 U.S.).

Of the W 13, 052,500 collected from the PTA, 27.8% goes for the building and equipment fund, 21.7% for school supplies, 40% for teacher salary supplement, 4.7% for student welfare funds, and 6.5% for contingency monies, it was reported. The tuition fees are turned into the provincial coffers. The Ministry of Education puts a ceiling on what teachers may receive beyond their basic salary, with W 10,000 per month as the maximum amount permitted beyond the basic salary.

The teacher's day is from 8:00 A.M. to 6:00 P.M. Monday through Friday and half a day on Saturdays. Students attend from 8:50 A.M. to 4:30 P.M.. weekdays.

There is some adaptation of national curriculum to local and regional difference, primarily in the illustrative material used to meet the demands of the program.

Finally, an unusual note was that,because the middle and high school were housed in the same plant together, no entrance requirements existed (no exam) for middle school graduates (about 80%) who wanted to continue in the high school. Almost all of the H.S. graduates go on to college, mostly in Seoul, but recently more are staying in Kangnung for higher education.

The Kangnung Agricultural and Technical H. S.

The school has 878 students, 37 teachers, 15 classrooms, and extensive outlying fields and barnyards and livestock pens. Programs exist in forestry, agriculture, animal husbandry, and food processing. About 47 percent of the students graduate, but there was considerable inexactness in what the graduates actually did upon graduation.

The school authorities have been working with the ministry to obtain an IDA loan to improve school facilities.

The fields and facilities (to eyes untrained in agriculture and animal husbandry) seemed well maintained and cared for. A special incentive was given students by organizing them into teams, lending the teams money, and permitting students to keep the profits earned after selling produce and repaying the loan or "seed" money.

Although the school seemed well run and students were observed at work without direct teacher supervision, the vagueness concerning what students actually did after graduation was a disturbing note. The discrepancies arose from inclusion in the statistical data of items dealing with what students said they wanted to do--if they could find the job--along with what their fellow graduates actually did do. As the "wanted-to-do" group was nearly 50 percent of the total, the meaning of the percentages was not clear.

Summary

The group concluded from this trip that the schools and systems for their control and management in Kangnung did not differ appreciably from those observed recently in other areas of Korea. The schools seemed remarkably similar both in their deficiencies and in their strengths; for the former, extremely high teacher-pupil ratios , over-crowding, poor or non-existing equipment and facilities, and a perceived declining supply of quality teachers; for the latter, tremendous demand for and support of education on the part of parents, alert staffs needing and wanting improvement for themselves, and a freshness and cooperative spirit in learning among pupils, especially at the primary school level.

Report on the Trip to Cheju-do Island and the Schools There

On 31 July a group of team members went by air to Cheju-do Island with Mr. Kim Jae Bum of CERI. The purpose of our trip was to visit a "remote area" and to learn about the situation in education there.

Cheju-do Island (also known in English as Quel Part) lies 60 miles off the south-western tip of Korea. Its surface is 692 square miles and measures 43 miles east-west and 20 miles north-south. Its population is approximately 360,000 with a 3.3 rate of increase, and its largest city is Cheju with a population of 68,000. 77 percent of the households are agricultural. The island is entirely volcanic with the central extinct cone, known as Mount Halla-San, rising to 6,398 feet. The island is covered with vegetation and is cultivated to about 2,000 feet. The temperature range is from 1.3°C to 31.4°C, at sea level.

The economy of the island is based on agriculture, husbandry, fishing, seaweed harvesting and preparation, shell products, orange cultivation and tourism. Orange cultivation was introduced in 1962 and has been very successful.

Only 38 percent of the island is electrified, and commercial television's inauguration on the island coincided with our group's visit For many years out-migration from the island exceeded in-migration, but recently more people come to the island than leave it.

Cheju-do is a political entity with its own governor and provincial capital at Cheju, the largest city on the northern coast of the island--less than two hours by commercial propeller aircraft from Seoul.

Visit to the Governor's Office

The group was received by the Deputy Governor, Mr. Kim Dae Keun, who explained that the provincial government was working on a local ten-year development plan that would be due before the end of 1970. Among the major development projects for the island are reforestation, development of tourism, further development of fisheries, and more intensive development of the recently introduced (1962)orange culture. The major thrust of these projects is to increase the income of the people living in the rural areas. (The per capita island income is $154 per year.)

Education was not included in the ten-year plan and was not linked to it. It was conceded that education must keep up quantitatively with vegetative growth, but there was no present effort to relate education to manpower needs. Nevertheless, the schools had already introduced orange culture as a special subject at all levels, and schools have been given seedlings to help promote the knowledge of orange culture techniques around the island.

The new relay TV station was to be inaugurated on 1 August 1970, and the changes that TV might promote both in and out of school were discussed.

Visit to the Office of the Local Board of Education

The Board of Education has a smaller organizational structure than in other provinces. There is only one school affairs bureau instead of the usual general affairs and educational affairs division of functions.

There are 1,351 primary school teachers and 794 secondary school teachers on the island. Beyond the 108 primary, 33 middle schools and 22 high schools on the island, there is one junior teachers college, a four-year national university and a three-year nursing school.

These institutions account for the 90,573 student population and give rise to a teacher-pupil ratio of 1:58 as an average.

Mr. Hyun Pyung Sook, presently the Director of the School Affairs Bureau,second in command under the Superintendent, had been the principal of the Fishery Technical High School,and at lunch he explained the following features of that school.

It was established in 1958, and now had 22 teachers and 360 students. Its program is built around three areas: fishing, food processing and marine engineering, all three-year high school level courses. About 10 percent of the students drop out before graduation. Of those who do graduate, 80 percent find employment, and one or two percent go on to higher education. There is an entrance exam for entry to this high school. The school has two school ships and a small food processing factory, but there are no marine engine facilities nor food freezing facilities.

With this first-hand information about the fishery high school from its former director and since the fishery high school was very remote and almost inaccessible on a very bad road, a second technical high school located at Hallim, a town on the north western coast of the island, was visted.

The Hallim Boys Technical High School

The high school was a two-story concrete structure that drew electricity from island sources but also had two generators of its own. The building was 18 years old and was well maintained but austere in appearance.

Fifty-five percent of the students come from the Hallim area; the others come from other parts of the island and are accommodated as follows: six percent live with relatives, 35 percent rent and cook for themselves, three percent live in boarding houses, and one percent serve as family tutors in exchange for room and board.

There are 650 students and 24 teachers of whom 13 teach vocational subjects and 11 teach general subjects. There is also a principal and vice principal, two clerical workers, and two janitors. These people work in 12 classrooms and six labs and offices.

The school day starts at 9:20 A.M. and ends at 4:50 P.M. for students, and at 8:30 A.M. and 6:00 P.M. for teachers. A fifty-minute period is the basic instructional module.

The program consists of four separate areas: Civil engineering, architecture, machine skills and electricity. The machine program is the most popular one. Students select their course during the first year and remain in the program for the three years. About 10 or 15 percent drop out before graduation.

Upon graduation, students receive a diploma but then must take national examinations for certification in their specialties. About 83 percent of those who seek employment find jobs. For example in 1970, 161 students graduated; 157 of them wanted jobs, and 130 obtained jobs.

This school is the only Trade and Industrial High School on the island, and with the Fishery Technical High School accounts for two of the ten vocational high schools on the island.

Students pay the following fees:

Student government fees:	W 170 / quarterly
Registration fee (one time):	W 1,300
Tuition:	W 1,600 / quarterly
PTA Fee:	W 1,800 / quarterly
Experimental fee & practice:	W 230 / quarterly

Beyond their basic salaries, the professional staff receive the following supplements each month from the PTA funds:

The Principal:	W 8,000
The Vice Principal:	W 7,000
Each Teacher:	W 6,000

The equipment and facilities in this school were old and worn and very rudimentary. The workshops seemed well maintained, and machinery seemed to be in operating order.

Conclusions

This "remote" area is indeed in physical appearance less developed and more needy than other parts of Korea. The possibilities for using the island for special "live laboratory" studies, such as a study on the effect of the introduction of commercial TV on the population and especially the school population is appealing. To a great extent local officials seemed future-oriented, as indicated by their work on the ten year plan and by their pride in the recent development of orange cultivation. However, they did not include education in the ten-year plan.

VIII. Curriculum

Much has been inferred throughout the foregoing pages regarding how students learn in Korean schools. The program of studies---a more narrow concept than curriculum which, according to the classic definition is the total experience of the child under the direction of the school, gives attention to the basic habits, knowledges, skills and attitudes found in traditional early 20th century school programs: the three R's, language, some science and the arts. A greater emphasis is placed on civic education and a special anti-communist education program at all levels.

Military science is taught at the secondary level for boys.

Judging from firsthand observation, the primary schools have strong programs in arithmetic operations, reading,and in music. Outstanding materials were seen in use for the teaching of arithmetic, and children performed well in music. However, no national scores were available, and this puts true analysis into the realm of estimation only.

Based on visits alone, it appeared that the primary school program was the superior one and that the secondary school programs flattened out in interest and in creativity as one progressed up the educational ladder. (University and community college programs were not observed.) The evidence for this statement lies in the amount of materials seen in use at the lower levels and in the appearance in all primary schools of a wealth of children's work. At the secondary levels,,the rooms were bare and note books and textbooks were the only media in sight.

The strong orientation of the school program toward upper level entrance examinations surely overshadows all else in the students' and teachers' worlds. Since there is less pressure at the primary school level, perhaps there is a greater chance for flexibility and creativity in teaching and learning.

The foregoing was borne out, too, in conversations with students. Long hard work days for secondary students were the rule and few failed to realize the earnestness of their performance as an index to future educational and career opportunities.

It was obvious from classroom visits that a great deal of teaching meant lecturing by teachers and memorizing by students. Under such a system, there is little chance for individual instruction, and indeed, under traditional methodology in classrooms of 65 or more, without new techniques and materials little more could be expected of 19th century technologies.

Only two teachers in just one school visited had more than a "recognition acquaintance" with programmed instructions and direct experience with instructional television. These teachers worked in Seoul and had attended an in-service program in these techniques, but they were not utilizing them with their classes.

At the secondary level, there was some familiarity with the ten-year old "new" mathematics and science approaches, but these approaches, based on direct experience,discovery and inquiry,are clearly incompatible with the examination orientation of instruction and with the size of the classes to be taught without anything but sound of voice and sleight of hand

A special problem relates to the reading program. The Korean language is transcribed in the Korean phoneticized alphabet, Hangul, and in Chinese characters. Theoretically, the Hangul alphabet is able to transcribe any Korean sound or word, but there are many words that have various multi-meanings, and context clues are often insufficient to make meanings clear. Therefore, it is customary to supplement Hangul with Chinese characters, thus expressing without a doubt the intended meaning. This is a practice of long tradition.

Recently, however, the ministry decided not to teach Chinese characters. Nevertheless, newspapers, magazines and books continue to use Chinese characters along with Hangul transcriptions. Slowly,then,groups of students are being graduated without the full literary competency required by the actual cultural tasks in reading that they will confront.

Another strong factor in the curriculum in South Korea is the strong emphasis on moral and spiritual values and on cultural integrity. It is hard to know how this is taught, but it is expressed time and again by teachers, administrators, and students as being important and as holding a special place in the curriculum and in the task of the schools.

Perhaps the most serious consideration to be made about the content of this school program is that it is primarily academic; it is geared to the scholar, to the future professional and white collar worker, and to a much lesser degree to those who might work with their hands as well as with their brains. The present goal for the majority of students enrolled is to gain entrance to the university and not to enter some prior selected business or industrial position. But other sections of this report treat this theme in a more technical fashion.

Since the curriculum is set centrally and textbooks are also controlled centrally by the MOE, there is little chance for local adaptations and for local initiative.

Any revision of Korean education must,without fail,take into account the curriculum, its purpose, its adequacy for the times, and most importantly, the ways in which it is carried out.

The following table shows the relative amounts of time devoted to the various subjects in South Korean Elementary Schools. (Source: CERI-1970)

Table VII

Rank order of percentage of time alloted to each subject during the six years of Elementary School

Rank	Subject	Percentage
1	Korean Language (Lang. Arts)	23.1%
2	Mathematics/Arithmetic	16.3%
3	Music/Fine Arts	14.4%
4	Social Studies	12.6%
5	Health/Physical Education	12.4%
6	Science	12.1%
7	Practical Arts	5.0%
8	Moral/Religious Education	4.1%

IX. Student Life: Typical Days for Secondary School Students

The Setting

During the many visits to schools throughout South Korea, team members spoke briefly with students, especially at the middle and high school levels. But these brief meetings did not provide for in-depth discussion. Accordingly, a three-hour meeting was arranged in order to find out more about student life and probe attitudes toward education and educational experiences. The meeting was held on 18 August 1970 at CERI, in Seoul. The purpose of this meeting was to probe the students' opinions about instructors, the use of ITV and about Korean education. Six students had been requested through channels and were invited by the MOE from the leading middle and high schools in Seoul.

The six ranged in age from 14-18, and all regarded themselves in the top five percent of their classes. Two of the six were girls, and three of the six were officers in their schools' student government.

The informal discussion took place at CERI offices from 2:00 p.m. until 5:00 p.m. Dr. S. Grant represented the FSU Team, Dr. Paik represented CERI, and Messrs. Jae Bum Kim and Kim Oki of CERI served as "guides" and interpreters.

The Questions and Replies (After greetings, introductions, and an explanation of the meeting.)

A. What is a typical school day like for you?

1. (High School Senior-male): Get up at 6:00 a.m. Take a half hour to go to school. Arrive at school at 7:00 a.m. Have five hours of classes till noon. Forty-minute lunch at noon. Then have three more hours of classwork. Leave school at 4:00 p.m. Read, study at home. Have dinner at 7:00 p.m. Go to bed at 11:00 p.m.

2. (Middle School-male): Get up at 6:00 a.m. Eat breakfast at 7:30 a.m. In summer go to school at 8:00 a.m., in winter at 8:30 a.m. Classes start at 9:00 a.m., and go till noon. At noon we have a 50 minute lunch, then two more hours of classes. Leave school at 3:00 p.m. Attend a private tutoring group until 7:00 p.m. (Seven other students are in group, and they study the same subjects as in school.) Dine at 8:00 p.m. Go to bed at 11:30 p.m.

3. (Commercial H.S.-female): Get up at 6:30 a.m. Start school at 8:00 a.m. in summer and at 9:00 a.m. in winter. (Day ends at same time in summer and winter, however.) Thirty minute lunch at noon, followed by three classes

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finishing by 3:30 p.m. (Evening school takes place in this school starting at 4:30 p.m. In her school, there are two major student groupings: academic oriented students and job oriented students. She dines at 8:00 p.m., and has no homework. She goes to bed at 11:00 p.m.)

4. (High School-male). Get up at 5:00 a.m. Take a student commuter train at 6:00 a.m., one hour ride into Seoul. Start school at 7:30 a.m. Four hours of classes, followed by lunch, two more hours of classes, finishing at 3:00 p.m. After leaving school I go to a public library to study. I catch the 6:00 p.m. train and get home by 7:00 p.m. Dine at 8:00 p.m. and go to bed at 11:00 p.m. (The special commuter train fare costs W 1,000 for three months.)

A. Among those in school with you, what percentage would you say had TV at home?

Answers: 75%, 95%, 95%, 95%, 60%, and 50%.

C. How many hours per week do you estimate that you watch TV?

Answers: 2 hours daily; 1/2 hour daily; 2 hours daily, but 4 hours on Saturday and Sunday; 1 hour daily, and 3 hours on Saturday and Sunday; 1 hour daily, and all day on Saturday and Sunday.

D. What do you think of TV as a way to learn?

1. It would be good for teaching biology.
2. It is a plaything; not very useful.
3. It keeps you from studying. TV's in schools should be put into special rooms, and used like other AV aids.
4. Present programming is very poor. It is dull and uninteresting.

E. Looking at your experiences in school over the last six months, what instances of "interesting" teaching can you recall?

(In order of reply)

1. Liked use of tape-recorder in English Fluency class.
2. Liked the dissection in biology.
3. Liked Peace Corps English Teacher.

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4. Liked use of Peace Corps Volunteers as judges in English-speaking contest.

5. Liked folk dancing, musicals, costume making competition, operetta.

6. Liked the military training.

7. Liked "student demonstrations."

F. To what extent do you receive individual instruction in your school work?

1. Most of the teaching is done in groups, but individual questions are asked and answered.

2. We get individual attention in sewing, handicrafts and in physical education.

3. There isn't enough time to get individual instruction.

4. We get individual attention in the fine arts and in drawing and painting.

G. What do you like most about school?

1. We like respectable teachers.

2. We like to prepare food snacks, poetry competitions and competitions in sports.

H. What do you dislike most about school?

1. Dislike short hair requirement, uniforms and military discipline.

2. Dislike not being able to go to theater and tea rooms.

3. Dislike lack of attention to each student.

4. Dislike long hours and homework. There is too much work and no time for oneself.

5. There are too many school assignments.

Most of these comments and others dealt with the work load which these students felt was excessive.

I. What do you think about the entrance examination system?

1. It gives you a reason to study; if there weren't exams, students wouldn't work.

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2. It gives you pride when you do well, but sometimes the exams are too difficult and too long.

3. They are needed because people are not equal, and exams are to separate those who work from those who don't.

4. They disturb the growth of some young people.

5. We dislike exams, but they are necessary.

J. If you were appointed Minister of Education, what changes would you make?

1. I'd train better teachers and get more new teachers. I'd stimulate others in education to teach better rather than from force of habit.

2. I'd do away with regulations requiring uniforms and short hair.

3. I'd give students more work experience in school; it's the only way to science and knowledge. There is none now; there's too much lecturing now.

4. I'd place more emphasis on special programs and on what is most effective for the nation, like civic education.

5. I'd find out how to make one half of the graduates go to the university and one half to get skills training via the community colleges.

6. I'd make sure students know more about our culture and history.

7. Students have individual aptitudes, so I'd let them chart their own direction more.

8. I'd put more emphasis on agricultural and fishery education. We need better technical schools and especially better agricultural community colleges.

9. I'd cut down on the required hours of schooling and put more emphasis on extra curricular programs.

10. I'd develop a school transportation system to take students to and from school. Public transportation for students is terrible.

11. I'd arrange for airplane trips, so classes could fly different places to see them first hand.

12. I'd reform education: I'd make elementary school the general part of education; then I'd offer more opportunity later for choice and specialization.

13. There should be more emphasis on Anti-Communist education and every girls' school should have military training.

14. There is too great a distance between the teacher and the students. I'd abolish bowing to the teachers. There should be more freedom in the classroom, more seminars and more class discussion.

K. What Should I Tell U. S. Students about Korean Schools?

1. South Korean students are sincere. We have no "hippies".

2. There is more group feeling here.

3. We are more mission-oriented than students in the U. S.

4. We are not "pro-sex". We are a morally oriented country. We have more respect for our elders and teachers. We are a country of Asian morality. Boys respect girls and girls boys.

5. We have a long historical tradition. Don't rate people by per capita GNP alone. We are behind on that, but that's not the only measure of a country.

6. Korean students try harder to improve their country through study.

STUDENTS PRESENT AT INTERVIEW SESSION

Age	Name	Grade	Secondary School
15	Choi, Young Chul	2	Sung Dong High School
18	Kim, Yeun Choong	3	Seoul Girl's Commercial HS
17	Oh, Sae Jung	3	Gyung Gi High School
14	Kim, Jae Hong	3	Choong Ang Middle School
14	Kim, Hung II	3	Sung Dong Middle School
14	Kim, Sung Hee	3	Jung Shin Girl's Middle School

X. Conclusion

Based on the foregoing reports, the following conclusions about the schools and the possibilities for innovation in South Korea are indicated:

1. The organization of the educational ladder into a 6-3-3 sequence is just one point of similarity between Korean schools and other schools. There are important basic characteristics that in their totality make Korean schools unique.

First, the Korean schools at present are strongly academically oriented. Their clients wish to become members of a professional white-collar, university elite. While its leaders have emphasized general education and increased enrollments, the basic orientation is still pyramidal and academic.

Second, this academic feature is made operational through an examination system which is a sorter from level to level. It was just two years ago (1968) that the examination from the primary school (6th grade) into middle school (7th grade) was abolished, and the abolition becomes operational completely only in the 1970-71 school year. As part of the culture, it is rare for a person to fail once he has made it into a level--but gaining access into a higher level is a formidable task.

Third, because of this examination system and because of other factors, too, a great deal of emphasis is placed on information and its retention rather than on concept development, inquiry and on the application of concepts, principles and ideas.

Fourth, there is tremendous social demand for education, and out of this demand for education comes the willingness on the part of parents to pay a significant annual sum--over and beyond what the state provides through public funds--for the education of each of their children.

Finally, the Board of Education as a local administrative unit closer to the people does not function as a unit that represents the public at the grass roots but rather as a group of wise, experienced men who sit as advisors to the local educational executive.

None of the foregoing is fixed and crystalized; it is in constant flux and is open to change. Yet these few characteristics comprise clearly a uniqueness of the Korean educational system.

2. The school plant in Korea is a glass of water filled to the brim. The great common feature observed in almost every school was the intense density of pupils per facility. Unless double shifting or year-round school* techniques are used, more enrollment almost certainly means more construction--without any promise at all for an improved program.

The facilities are essentially of the 19th century egg-crate design. They are daytime facilities in the main, for even those buildings that may be classified as having electricity often are not operational electrically, and most would require rewiring for any additional equipment other than electric light bulbs. Many buildings do not have electrical facilities at all.

The equipment in the schools--other than teacher-prepared charts and aids, which were excellent at the elementary school level--was very old, antiquated and inadequate.

Any plan for innovation must take into account this "glass of water filled to the brim."

3. The administrative lines are highly centralized and highly responsive to authority. Arrangements for visits could be made in a moment's notice. The communications were smooth and effective. People understood what was needed, and what was wanted, and they responded effectively and responsibly.

One had the feeling of an unusual alertness and of a high level of responsibility among the administrators of the system. This human resource bodes well for future plans and designs that might promote or propose innovation.

In the schools themselves, it was common for the administrative staff to meet with the teaching staff once or twice a day. Thus, good lines were open for information exchange. The style of leadership, however, seemed to be somewhat paternalistic and benevolent, but we must stress the word *seem*, for no measures were taken systematically to probe leadership styles.

Korean school administration has undergone tremendous changes in the past twenty years, and it is still in flux. Major changes occurred after WW II, after the Korean War, and after the Revolution of 1961. Although Koreans talk of "tradition", they have made many more innovations administratively than many other "less traditional" countries.

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*There are serious climatic drawbacks to year-round schooling especially in the winter months, for central heating is a rarity.

4. Korean educators are proud of their quantitative accomplishments. Their schools show this growth with their hybrid construction patterns reflecting a Japanese style school and various other style annexes added throughout the years as school populations have grown. Administrators say that now they want to improve the quality of education.

They imply in this that they want and need a "rest" from the increase in enrollments.

They also speak of change in additive terms: more teachers, more books, more materials, better and more facilities. They do not think in terms of new techniques for changing the ways in which things might be done.

Some educators in the schools, when questioned about their own opinions toward new techniques such as differential staffing, or ITV, were open to the ideas, but thought of more reasons why things could not be done than ways in which they might be tried.

Some educators were candid in expressing their concerns that modernization meant Westernization and that Westernization like the Western movie of sex and violence was not what they wanted.

Another blockage to creative thinking was the financial one. Many educators could not or would not even entertain thoughts of innovation because they were flatly "financially impossible."

There was a noticeable difference between what high-level ministry and university people in Seoul were able to consider, analyze, and discuss about innovation and what most of the people in the schools and in the provinces were able to contemplate.

Any plan for innovation must take into account the differences between the readiness of top-flight people in Seoul and of the professionals who are not at the professional and communications control network in Seoul. In this regard at least four steps must be taken if people in the field are to be able to participate fully and effectively in plans for innovation:

A. They must be helped to think of quality improvement along non-additive lines of development.

B. They must be assisted in becoming informed about the nature and variety of new techniques--not through hearsay, but through some respected and systematic information system.

C. They must be encouraged to free themselves from "Financial Blackouts" that seem automatically to prevent them from further consideration of really new ideas.

D. They must be reassured that modernization need not mean Westernization.

5. Very great care must be taken in any manipulation of the PTA system. The extent of the collections and the pervasive nature of that sub-system make any adjustment in the system bound to have deep repercussions. Teachers want and expect the "extra" money (which is not extra, but is "compensatory" to them), and parents continue to pay the fees--and indeed--expect to pay them. The sub-system works in this culture, and one should look at any major change in it with great caution, especially when it is part of an appreciable financial support of education.

6. The role of political life in a country's or community's education is both covert and overt. Only recently have educators discussed openly and candidly the "politics of education." That they did not do so earlier around the world was to the detriment of the schools and to the disadvantage of the educators themselves.

In Korea, education is squarely within the politics of the nation, for the minister is a cabinet member and the cabinet has major legal responsibilities for education. Any plans for change, then, must have full political support--not in the narrow sense of enough votes to swing a key decision but, more importantly, in the sense that political leadership fully understands what is contemplated, is enthusiastically behind new plans, and is willing, if necessary, to fight political battles to support needed educational changes in which they believe.

7. Plans for change are usually made and carried out on a pilot basis. Along with such a pilot study with its usual technical evaluation, there must be a socio-cultural analysis, probing the attitudes of the administrative teacher, children and parents regarding new ideas and changes. Studies should be made of how changes mesh with, are neutral to, or clash with various cultural patterns.

For example, one might conclude from looking at the Korean exam system that Korean education was highly competitive, but in the personal situation of the classroom no one seems to fail. So at access points that are impersonal, the system can be ruthless; in the personal face-to-face realm, respect for person seems to take precedence over objective "merit." Factors such as these may be crucial to the success in the introduction of a new technology.

All in all, the prognosis for change and innovation if handled skillfully is very good. There is spirit of development, a healthy respect for quantitative techniques, a professional alterness in the schools, and most important of all, an infrastructure for change.

Specifically, it is auspicious to find two small but excellent change filters and agents already in place in Korea: the central Education Research Institute (CERI) and the Korean Institute for Research in the Behavioral Sciences (KIRBS) both linked with the MOE's own Office of Planning. These three institutional units, with appropriate support from the universities, could make a superb team that could bring about significant and lasting changes in Korean education. Indeed, both groups have already begun activities that form a basis for this work.

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Appendix B

Schooling and Earning Differentials: The Korean Experience

by

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SCHOOLING AND EARNING DIFFERENTIALS: THE KOREAN EXPERIENCE

by

John Chang

1. Introduction

Why does person A earn more than person B? What econo-educational explanations can we give to the observed earning differentials among individuals? The answers are complex and numerous. In fact, it will be practically impossible to exhaust all factors that play important roles in determining the levels of individual income. They include ability, education, luck, family background, race, discrimination, etc., just to cite a few. Hansen, Weisbrod, and Scanlon write on the determinants of a person's earnings as follows:

> "We can quickly assemble a catalog: (1) physical conditions, including one's general state of health and presence of any disability; (2) learning and experience, determined by the quantity and quality of formal education and job training, innate ability, and the collection of experiences which contribute to a person's knowledge and skill; (3) psychological characteristics, among them work-leisure preferences, motivation, and the ability to communicate and cooperate in work situations; (4) family environment, reflecting informal learning in the home, and also the contacts and opportunities that the family can provide; (5) job access, which includes economic opportunities in the area as well as the degree of racial and other types of discrimination. This listing is by no means complete, nor are the classes mutually exclusive, but the number and complexity of the forces likely to affect earnings are abundantly clear."[1]

An economic explanation is centered around what economists call the market value of marginal product that a person contributes to final products. The theory of marginal product subscribes the level of earnings to the productivities of individuals - i.e., earnings will in general be different. The question then should be restated as, "What are the determinants of the marginal product of a person?"[2] Or stated differently, "What causes the heterogeneity of productivity?" The human capital approach is to relate the length of training (school training, on the job training, etc.) as the basic cause for the productivity differentials. That is, the opportunity cost of going to schools and obtaining skills for future occupation must be compensated with higher future earnings. This is undoubtedly true for vocational schools such as medical, law and various technical and vocational institutions.[3] A critical problem we face here is that there is no clear-cut method of quantifying many of these factors that determine individual productivity. Even if we can quantify some measures, such as schooling, often they are grossly inadequate and superficial. For example, the number of years in school is not a good measure of a man's learning neither does intelligence measuring (Intelligence Quotient) capture his productivity.

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[1] See W. Lee Hansen, Burton A. Weisbrod, and William J. Scanlon, "Schooling and Earnings of Low Achievers," American Economic Review, June, 1970.

In spite of such problems, a number of empirical studies have been performed. They relate individual earnings to years of schooling, length of job training, ability index, and other relevant demographic variables, such as, family sizes, race, etc.[4]

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[2] Admittedly the theory of marginal product is valid only under the conditions of perfect competition, and the real world as we know today does not represent the perfect competition. However, we note here that even in the monopolistic market the price of an input factor is approximately proportional to its marginal product.

[3] One of the shortcomings of human capital approach lies with the inability to distinguish the education expenditures for investment from that for current consumption. In order to proceed with the Cost-Benefit analysis, we have to distinguish from the total outlay that portion of education expenses that give rise to current consumption, for not all educational expenditures are in the form of investment.

Results of the studies show that these variables are statistically significant in explaining the levels of individual earnings. However, a common characteristic of all such studies is that the coefficient of determination is quite low, meaning the models explain only a small fraction of the sample variations. Obviously,there are other important sources left out that determine the majority of variations of the earning differentials of individuals.

Even though it is an insurmountable task to explain earning levels of every individual in the economy, an attempt can be made with fruitful results to determine the differential levels of earnings among groups of individuals--individuals of similar backgrounds in schooling and training. What we gain by combining individuals into groups with similar background is the chance that differences in other factors, such as abilities and family connections, tend to cancel out within the cell, leaving the mean level of earnings to depend largely on the schooling and training variables. And since individual differences are taken out of the sample, we are bound to obtain higher statistical significance in terms of R^2 and t-values of estimated coefficients, which in turn give more reliable information about the group behavior (as opposed to individual). The determinants of group earnings among different educational levels will therefore cast considerable light on educational policy decisions such as whether or not to educate more people at higher levels. If the present value of lifetime earning differentials between the more and the less educated groups is larger than the corresponding costs (cost of additional schooling plus the opportunity cost), we may decide in favor of more education.

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[4] See W. Lee Hansen, Burton A. Weisbrod, and William J. Scanlon, "Schooling and Earnings of Low Achievers," American Economic Review, June, 1970, and Jacob Mincer, "The Distribution of Labor Income: A Survey With Special Reference to the Human Capital Approach," Journal of Economic Literature, March, 1970, and other articles listed therein.

Of course, educational policy making is not as simple as this, and we take a detour to look at the social aspects of education before we spell out the methodology of this study.

2. To Educate or Not to Educate

Let us suppose a hypothetical society characterized by $W(H,P,C_H,C_p)$ where H and P stand for the amount of human and physical capital respectively; C_H and C_P are respectively social costs of obtaining H units of human and P units of physical capital; and W is the welfare function describing the general welfare status of all aggregate constituents. The difficult nature of the decision maker who is faced with the problem of deciding whether or not to educate more people can be seen as follows: since his decision will change the amount of human capital, we can write the percentage changes of W as,

$$\text{(A)} \quad \frac{1}{W}\frac{dW}{d_t} = \frac{1}{W}\frac{\partial W}{\partial H}\frac{dH}{dt} + \frac{1}{W}\frac{\partial W}{\partial p}\frac{dP}{d_t} + \frac{1}{W}\frac{\partial W}{\partial C_H}\frac{dC_H}{dH}\frac{dH}{dt} + \frac{1}{W}\frac{\partial W}{\partial C_p}\frac{dC_P}{d_p}\frac{dP}{d_t}$$

where we assume that C_H, C_P are functions of H and P respectively and $\frac{\partial W}{\partial C_H}$, $\frac{\partial W}{\partial C_P}$ are negative.

Equation (A) states that the percentage changes of the general social welfare function, W, is the sum of percentage changes of W from 1 unit change of human and physical capital minus percentage change of welfare costs of bringing 1 unit change of H and P. Since the society, human, and physical capital last long periods of time, the decision maker should maximize (A) over virtually infinite period of time, i.e., we have,

$$\text{(B)}\quad \text{Max}\int_{0}^{\infty} e^{-rt} \left(\frac{1}{W}\frac{dw}{dt}\right) d_t = \text{Max}\int_{0}^{\infty} e^{-rt} \frac{1}{W}\left\{\frac{\partial W}{\partial H} + \frac{\partial W}{\partial C_H}\frac{dC_H}{dH}\right\}\frac{dH}{dt}dt + \text{Max}\int_{0}^{\infty} e^{-rt}\frac{1}{W}\left\{\frac{\partial W}{\partial P} + \frac{\partial W}{\partial C_P}\frac{dC}{dP}\right\}\cdot\frac{dP}{d_t}\, d_t$$

where e^{-rt} is the instantaneous discount factor of future welfare changes derived from current decisions.

If we assume the orthogonality of human and physical capital functions, the education planner is faced with the problem of maximizing the first term on the right hand side of (B). In order to see more clearly, let H and C_H be functions of X_1, X_2, X_3, where X_1 is the total number of grade school graduates, X_2 that of high school graduates and X_3 that of college graduates in the society. That is, we assume that the total human capital, H, is determined by the number of persons with different educational backgrounds. We can then rewrite the first term on the right hand side of (B) as,

$$\text{(C)}\quad \text{Max}\int_{0}^{\infty} e^{-rt}\left\{\sum_{i=1}^{3}\frac{1}{W}\left(\frac{\partial W}{\partial H}\frac{\partial H}{\partial X_i} + \frac{\partial W}{\partial C_H}\frac{\partial C_H}{\partial H}\cdot\frac{\partial H}{\partial X_i}\right)\frac{dX_i}{dt}\right\} dt =$$

$$\sum_{i=1}^{3}\text{Max}\int_{0}^{\infty} e^{-rt}\frac{1}{W}\left(\frac{\partial W}{\partial H}\frac{\partial H}{\partial X_i} + \frac{\partial W}{\partial C_H}\frac{\partial C_H}{\partial H}\cdot\frac{\partial H}{\partial X_i}\right)\frac{dX_i}{dt}\cdot d_t$$

where it may be useful to call $\frac{\partial W}{\partial H}\cdot\frac{\partial H}{\partial X_i}$ = the marginal human capital welfare of X_i, meaning the amount of social welfare increase brought about by the change of human capital which is caused by adding one more X_i. Similar interpretations can apply to $\frac{\partial W}{\partial C_H} \cdot \frac{\partial C_H}{\partial H} \cdot \frac{\partial H}{\partial X_i}$, that is, the marginal human capital costs of X_i, meaning the amount of welfare decrease brought about by the change of social costs which are caused by adding one more X_i. Some of the implications of equation (C) are interesting.

(1) If $\frac{\partial W}{\partial H} \frac{\partial H}{\partial X_i} > \frac{\partial W}{\partial C_H} \frac{\partial C_H}{\partial H} \cdot \frac{\partial H}{\partial X_i}$ for all future time, then produce more X_i.

However, if the educational system requires pupils to graduate from grade school in order to proceed to high school, then whether or not to produce more high school graduates should rest on whether or not the sum of marginal human capital of X_1 and X_2 is larger than the sum of human capital costs of X_1 and X_2.

(2) The opposite of (1) holds, i.e., if $\frac{\partial W}{\partial H} \frac{\partial H}{\partial X_i} < \frac{\partial W}{\partial C_H} \frac{\partial C_H}{\partial H} \frac{\partial H}{\partial X_i}$, do not produce more X_i.

(3) The education planner faces the most difficult situation--and there are reasons to believe this is the commonest--when the marginal human capital welfare of X_i is larger than the marginal human capital costs of X_i in certain time periods, but the reverse is true in other time periods. That is, over long periods of time into the future, the social welfare function may change to such an extent that the more educated people there are, the worse off the society will be. In this case, the planner should obtain some sort of weighted averages of the net welfare increases over the infinite planning periods. Obviously, no mortal soul can accomplish the impossibility

unrealistic except where educated unemploy problems are increasing, even then policy decisions don't curtail further prod of knowing all future social welfare functions. The fact of the matter is that we cannot uniquely determine whether or not social welfare, W, increases as more educated persons are added to the society. In fact, some people claim that college education, for example, is not meant for every one, and therefore producing more college graduates is not necessarily better for the society as a whole. This brings up the argument of externality which we do not go into here. However, what we have shown here is that the principle of social welfare maximization does not lead us to a unique set of rules under which we can make decisions such as whether to educate more or not.

The whole picture is not as bleak as it may sound. There is one saving grace upon which we can base our judgment whether or not to educate more people. We can accomplish this by replacing the social welfare function with an economic welfare function. That is, the rule is to educate anyone as long as the value of the output increment brought about by his education is larger than the cost of educating him. This is by no means an ideal yardstick, but it is an objective rule that the planner can follow.

In this paper, therefore, an attempt has been made, for the case of South Korea, to compare the earnings of groups of people to their levels of education and job proficiency to see whether or not the level of education has caused them to get higher rates of returns.

3. Methodology and Data

It is postulated that the personal earnings are primarily determined by the levels of schooling and the degree of occupational proficiency, i.e.,

(D) $E = f(S, Y, u)$

Where E = yearly earnings in Won[5]

S = levels of schooling - middle, high, college graduates

Y = the number of years served on the job - a measure of the proficiency in his occupation[6]

u = a random variable which accounts for all other relevant forces that are excluded in (D).

Assuming a linear relationship between E and Y, equation (D) can be expressed as,

(E) $E = a_o + a_1Y + b_1S_1 + b_2S_2 + b_3S_3 + u$

where S_1, S_2, S_3 are dummy variables representing respectively middle, high and college graduates.

Equation (E) is a combination of four different earnings relations given.

$$E_e = a_o + a_1Y$$

$$E_m = a_o + a_1Y + b_1$$

$$E_h = a_o + a_1Y + b_2$$

$$E_c = a_o + a_1Y + b_3$$

Where E_e, E_m, E_h, and E_c are respectively the mean earnings of elementary, middle, high, and college graduates, Therefore, the expected earnings differentials between the successive educational levels are shown[7] to be,

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[5] Won is the South Korean monetary unit and approximately 312 Won is equivalent to 1 dollar U.S.

[6] The number of years of services is by no means an ideal measure of one's expertness in the occupation, but the lack of alternatives forces us to use it as a first proxy for the degree of job proficiency.

$$E_m - E_e = b_1$$

$$E_h - E_e = b_2 - b_1$$

$$E_c - E_h = b_3 - b_2 \,.$$

The present value of the lifetime total earning difference, B_{ch}, between college and high school graduates can be approximated[8] by

$$\text{(F)} \quad B_{ch} = \frac{b_3 - b_2}{r}$$

where r = the prevailing market interest rate. We can compare B_{ch} with the present value of the college cost, C_c, which is given by $C_c = \Sigma_{i=1} C_i \, (1 + r)^i$, where C_i = the amount of the total college education.

It will be easy to construct the ratio of B_{ch} to C_c as a function of r, and if the ratio is larger than 1, we can conclude that the college education is worthwile.

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[7] It should be understood that these earnings differences are biased measures of the impact of schooling on the earnings levels. If fact, the bias is upwards. The reason is that the South Korean educational system selects, through competitive entrance examinations, more capable and intelligent students to go on for further education. The upshot is that we can presume the mean earnings of all college graduates, even if they didn't go on to college, would be higher than that of their high school counterparts.

[8] Assuming there are 45 years of working life left after the college graduation, the exact expression for B_{ch} is given by,

$$B_{ch} = \frac{b_3 - b_2}{r} \left(1 - \frac{1}{(1+r)^{45}}\right)$$

It can be readily seen that if r = 0.1, the error introduced by the approximation is in the order of 1%.

The data used in this study come mainly from two sources: The Bank of Korea and The Ministry of Education. The earnings data for Employees of Mining and Manufacturing Workers by levels of Education and by Duration of Work were obtained from the "Report on Wage Survey" published by The Bank of Korea in 1967. The data is updated by adding the annual increase of 30% in salaries. There are five classifications under Duration of Work -- under 1 year, 1-2 years, 3-9 years, 10-19 years, and 20 years and over. The mid-point of each class was used in the regression as a first approximation for the number of working years except the highest open interval, where 25 years was adopted as the mean years of work. The annual gross wages are the sum of Cash Earnings plus Fringe Benefits and annual Special Earnings.[9] The costs of educations are obtained from the "Statistic Year Book of Education" published in 1969 by the Ministry of Education. The total cost of education then is obtained by adding the opportunity cost of going to school to the cost of education.

4. Empirical Results and Conclusions

The regression of earnings on duration of work for different educational levels is as follows:

$$\text{(G)}\quad \begin{array}{lllll} E = 69.5 + & 11.0Y + & 76.1S_1 + & 172.1S_2 + & 325.5S_3 \\ (1.8) & (5.9) & (1.6) & (3.5) & (6.7) \end{array}$$

$$R^2 = 0.810$$

where the numbers within parentheses are the t-values of the estimated coefficients. Equation (G) shows b_1, b_2, and b_3 are positive and furthermore b_3 is larger than b_2, which in turn is larger than b_1 as expected. The present value of the benefit of college education is given by,

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[9] The Bank of Korea estimates the annual Special Earnings for different education levels as 52.4% of Cash Earnings for primary school graduate, 66.9% for middle school graduates, 88.9% for high school graduates, and 126.2% for college graduates.

$B_{ch} = (325.5 - 172.2)/r$ and the cost of college education is given by $C_c = 320\ [(1+r) + (1+r)^2 + (1+r)^3 + (1+4)^4]$.

The Benefit-Cost ratio is then equal to,

$$\frac{B_{ch}}{C_c} = \frac{0.479}{r[(1+r) + (1+r)^2 + (1+r)^3 + (1+r^4)]}$$

The Benefit-Cost ratio can be computed and plotted against various values of r.

Figure B-1

Benefit-Cost Ratio vs. Rate of Return

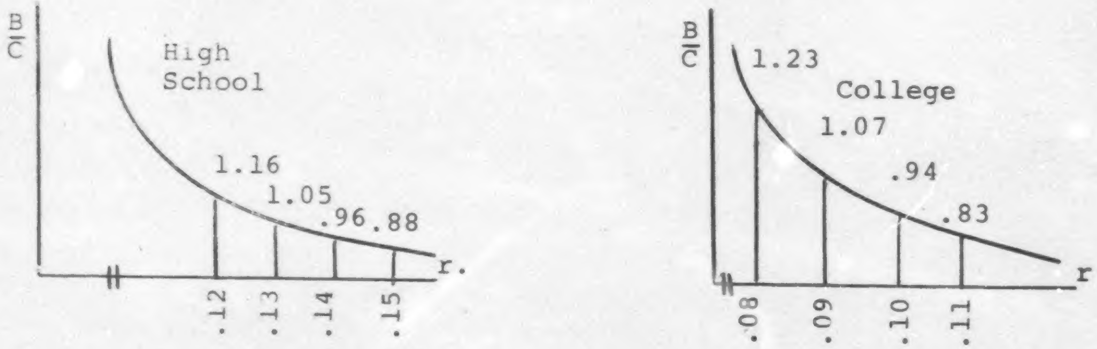

Figure B-1 shows the Benefit-Cost curves for high school and college education. The Benefit-Cost ratio decreases as the rate of interest increases. This is exactly as one would expect it to be, because as the interest rate increases, the rate of return foregone on the amount of investment made on education becomes higher and therefore diminishes the Benefit-Cost ratio. We can readily obtain the break-even rate of interest from Figure B-1. That is, the critical interest rate is at that rate that equates the Benefit-Cost ratio to

1. For college education, for example, the critical rate of return as 9.5%.

Table B-1 summarizes the rates of return for middle school, high school and college.

Table B-1.

Rates of Return

Middle School	26.5%	20.0%*	12.0%**
High School	13.5%	11.0%	9.0%
College	9.5%	9.5%	5.0%

*   Figures adjusted for unemployment.
** Rates of return obtained by Kim.[10]

The rate of return (20.0%) for the middle school education is almost twice as large as that of the high school education (11.0%). Generally the results of this study are higher than that of Kim's. The reason for the discrepancy comes from the different methods used in the computations. Kim has used forecast earnings figures to obtain the present value of the future benefit. One needs not to be reminded of the magnitude of forecasting error in a dynamic economy such as Korea (particularly when one has to forecast 40 years in the future!).

We find it difficult to accept Kim's conclusion that since the rate of return on physical capital is about 20%, Korea should divert its resources from education to physical capital investment. This study indicates that the rate of return on middle school education is 20.0%,suggesting further increase of middle school graduates. Even if the rate of return on high school and college education is lower than 20%, we cannot meaningfully compare the return of education to that of physical capital, because the investment return from physical capital is closely related to the general level of national education. We have to remind ourselves that the seemingly high rate of return accrued to physical capital investment is possible only when the labor force is skilled enough to make the capital fruitful. Therefore the rate of return on physical capital is based upward if the productivity increases of labor force are ignored. This brings us to the questions of productivity increases of labor and capital, which we do not wish to go into at this point.

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[10] See Kim, Kwang Suk, "Rates of Return on Education in Korea," USAID/K, September, 1968.

We conclude from the study that the monetary rates of return on education in South Korea are high and we should encourage not only middle school education (rate of return = 20.0%) but also high school (11.0%) and college (9.5%) as well. The reasons are that: (1) even though the pecuniary return on high school and college investments may be lower than that of physical capital investment (20.0%), nonpecuniary benefit of higher education accruing to individuals and society as a whole should compensate the monetary returns; (2) the high rate of return on physical capital investment is possible because of the available pool of highly skilled manpower in the economy; (3) given the average inflation rate of 10% per year, the nominal rate of return of 19.5% for college education and 23.5% for high school education is comparable to the bank interest rate of about 22% during the summer of 1970.

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APPENDIX C

Estimate of Annual Education Expenditures per students by different levels of school, 1969. (number of students in thousand & Expenditures in million won)

	Primary School	Middle School	High School	Junior Technical College	Junior College	Junior Teacher's College	College & University	Special School	Total
1. Number of students (persons) 1/	5,622.8	1,147.4	530.1	20.7	8.1	11.0	132.9	3.9	7,476.9
2. In-school Expenditures (won)	42,870.0	17,756.5	11,625.4	789.9	608.0	604.2	12,183.8	85.9	86,523.7
a. National education expenditures (Central gov't) 2/	-	-	-	-	-	604.2	2,804.8	85.9	3,494.9
b. Local gov't expenditures for public schools 3/	39,533.4	5,607.9	4,154.2	315.1	-	-	-	-	49,610.6
(Includes gov't & subsidies from Central gov't)	-	-	-	-	-	-	-	-	-
*All gov't finances (a+b)	39,533.4	5,607.9	4,154.2	315.1	-	604.2	2,804.8	85.9	53,105.5
c. Education expenditures of private schools 4/ (Less gov't subsidies)	527.7	6,069.5	4,662.7	246.3	499.5	-	6,786.3	-	18,792.0
d. P.T.A. expenditures for Education 5/	2,808.9	4,398.1	2,031.9 (6,430.0) 6/	100.9	55.0	-	1,035.0	-	10,429.8
e. Experiment & practical expenditures for Education 7/	-	707.5	326.8 (1,034.3) 6/	77.9	34.5	-	1,002.4	-	2,149.1
f. Student Self-governing expenditures 8/ (less subsidies from school budget)	-	973.5	449.8 (1,423.3) 6/	49.7	19.0	-	555.3	-	2,047.3
3. Out-of-school expenditures for education	40,326.8	17,296.0	11,763.8	699.0	439.6	599.1	7,279.1	-	78,403.4
4. Total education expenditures	83,196.8	35,052.5	23,389.2	1,488.9	1,047.6	1,203.3	19,462.9	85.9	164,927.1
5. Total education expenditures per students (in thousand won)	14.8	30.6	44.1	72.0	129.4	109.4	146.5	22.3	22.1
a. in-school expenditures	7.6	15.5	21.9	38.2	75.1	54.9	91.7	22.3	11.6
b. out-of-school expenses	7.2	15.1	22.2	33.8	54.3	54.5	54.8	-	10.5

1/ M.O.E. Statistic Yearbook of Education 1969, M.O.E.

2/ M.O.E. Statistic Yearbook of Education 1969, p. 65 table 40.

3/ M.O.E. Statistic Yearbook of Education 1969, p. 72 table 45.

4/ M.O.E. Statistic Yearbook of Education 1969, p. 83 table 50.

5/ M.O.E. Statistic Yearbook of Education 1969, p. 87 table 53.

6/ Total amount of middle and high school expenditures.

7/ M.O.E. Statistic Yearbook of Education 1969, pp. 88-89 table 53.

8/ M.O.E. Statistic Yearbook of Education 1969, pp. 88-89 table 54.

APPENDIX D

Estimate of Annual out-of-school expenditure by school level, 1969

(Unit: won)

Item / School Level	Expenditure per student 1968	Expenditure per student 1969 1/	Total Expenditure in 1969	Expenditure per student 1968	Expenditure per student 1969 1/	Total Expenditure in 1969	Expenditure per student 1968	Expenditure per student 1969 1/	Total Expenditure in 1969
Textbooks	183	195	1,096,449,120	660	705	808,922,640	1,477	1,577	856,951,262
Learning Materials	500	534	3,002,583,744	1,326	1,416	1,624,729,728	2,612	2,789	1,515,559,334
Stationary (Supplies)	1,267	1,353	7,607,670,048	2,791	2,981	3,420,423,248	3,538	3,778	2,052,987,868
Group (circle) Activities 2/	554	592	3,328,707,072	844	901	1,033,814,608	2,221	2,372	1,288,959,032
Special Activities (in School) 3/	814	869	4,886,227,104	570	609	698,771,472	733	783	425,486,898
Various Test	179	191	1,073,957,856	715	764	876,619,712	335	358	194,539,348
Social Services 4/	47	50	281,140,800	55	59	67,697,072	93	99	53,797,194
School Health 5/	41	44	247,403,904	49	52	59,665,216	59	63	34,234,578
Transportation	330	352	1,979,231,232	1,483	1,584	1,817,494,272	2,465	2,632	1,430,244,592
School Identification and Marks 6/	1,040	1,111	6,246,948,576	3,706	3,958	4,541,440,864	4,481	4,785	2,600,197,710
Tutoring or Outside Studies	1,761	1,881	10,576,516,896	1,915	2,045	2,346,449,360	2,768	2,956	1,606,308,136
Total	6,716	7,172	40,326,836,352	14,114	15,074	17,296,028,192	20,782	22,192	12,059,265,952

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* Expenditure per student in 1968; Data based on C.E.R.I. survey report of study for projection of private & public expenditures on education for 1968.

1/ Data for expenditure per student in 1969 is as of 1968 multiplied by 106.79, because of raising the price (See

1965	100.0	
1966	108.8	
1967	115.8	
1968	125.2	100.00
1969	133.7	106.79

(ROK Economics Statistic Yearbook 1970.)

APPENDIX D:

Estimate of Annual out-of-school expenditure by school level, 1969 (continued)

Item / School Level	Junior College (26,575)7/ Expenditure Per student 1968	Junior College (26,575)7/ Expenditure Per student 1969	Junior College (26,575)7/ Total Expenditure in 1969	College & University (132,930) Expenditure per student 1968	College & University (132,930) Expenditure per student 1969	College & University (132,930) Total Expenditure in 1969
Books	14,239	15,206	404,099,450	15,119	16,146	2,146,287,780
Stationary (Supplies)	4,141	4,422	117,514,650	10,211	10,904	1,449,468,720
Group (circle) activities	1,189	2,017	53,601,775	2,600	2,777	369,146,610
Special activities (in-school)	9,583	10,234	271,968,550	7,230	7,721	1,026,352,530
Various test	65	69	1,833,675	57	61	8,108,730
Social services	399	426	11,320,950	414	442	58,755,060
School health	5,434	5,803	154,214,725	7,238	7,729	1,027,415,970
Transportation	11,273	12,038	319,909,850	5,662	6,046	803,694,780
School Identification and Marks	2,805	2,995	79,592,125	2,359	2,519	334,850,670
Others	990	1,057	28,089,775	388	414	55,033,020
Total	50,818	54,267	1,442,145,525	51,278	54,759	7,279,113,870

2/ Included: boy (or girl) scout, English conversation group activities, etc. This expenditure is not the compulsory but the individual basis.

3/ Included: in field observation, school festival or drama, athletic meeting. This is more compulsory than the group activities.

4/ Included: help of classmate, present for army personnel, etc.

5/ Included: X-ray test, blood test, injection for various disease protection, etc.

6/ Included: bag, uniform, badge, name card.

7/ Included: composed of junior technical college 4th and 5th grade (7,436), junior teacher's college (11,038) and junior college (8,101) student.